OUR MANY-SIDED NAVY

R. W. NEESER

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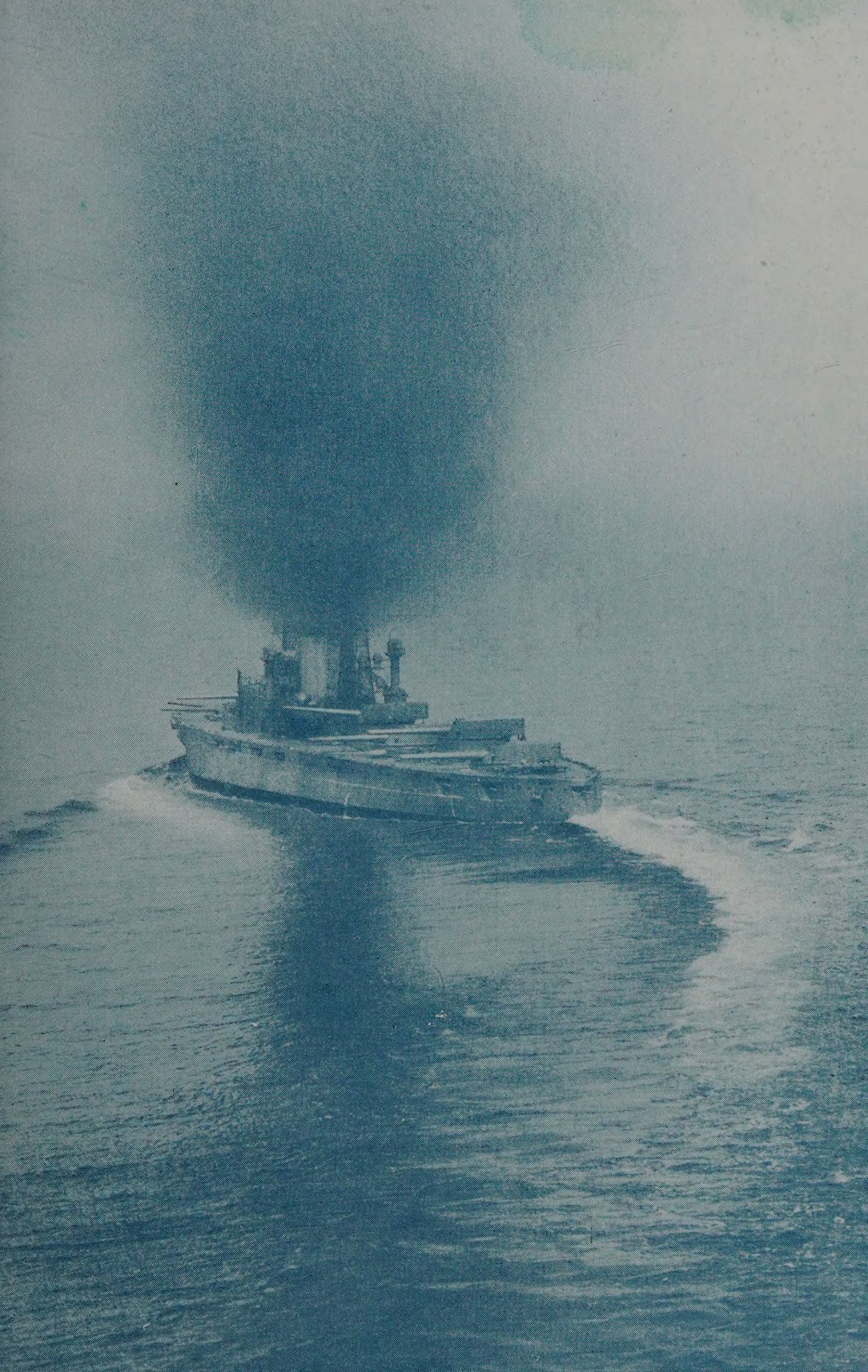

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OUR MANY-SIDED NAVY

By the Same Author

A LANDSMAN'S LOG

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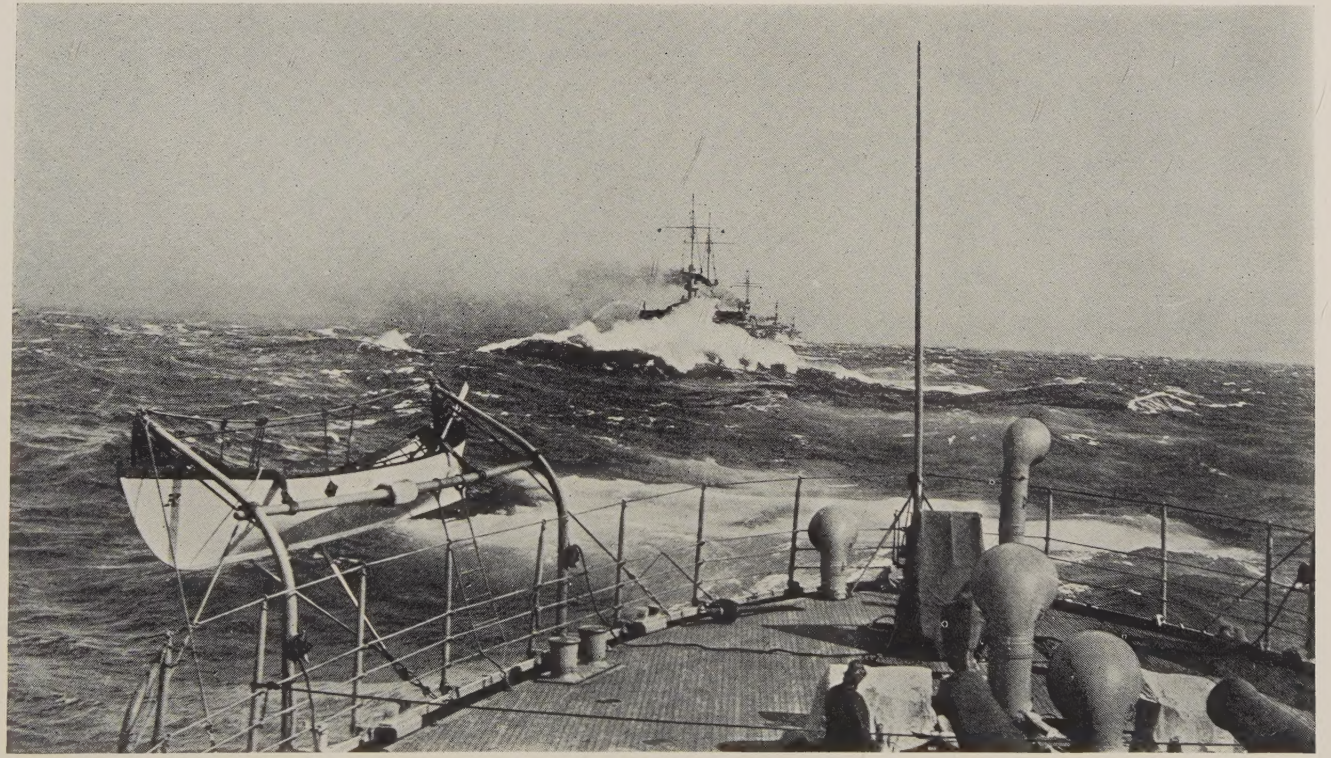

Battling with the Elements

OUR MANY-SIDED NAVY

By

ROBERT WILDEN NEESER

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TO

CHARLES J. BADGER

REAR ADMIRAL, U. S. N.
COMMANDER-IN-CHIEF OF THE UNITED STATES
ATLANTIC FLEET

PREFACE

All the world loves a bluejacket, but not all the world can understand him, the essentially human side of his life, his professional enthusiasm, his pride in his ship, and his noble, unselfish devotion to his country and to his flag. All this, and more, the landsman may be willing to believe; but grasp it he cannot unless he has actually made the ship at sea his home, messed with her officers and mingled with her crew, and absorbed the atmosphere—unlike anything on shore—that pervades every compartment of that great floating community of a thousand souls encased within those walls of steel.

The vital need of the navy of the United States today is to have the people of the United States know more about it and care more about it. It is one thing to have the navy popular. But when that popularity is accompanied by a total ignorance of, and indifference to, the nature and meaning of the service, it is a doubtful advantage, calculated to do harm rather than good. Let the people understand that the navy is a most serious institution, the service an earnest business, and the uniform not merely brass buttons and gold lace; that upon its efficiency and well-being

depends our national safety; that it was a navy (the French) which made sure our independence, and our own navy which, in the War of 1812, preserved this independence, and again, in the Civil War, saved us from dismemberment—for, without the blockade, we should never have overcome the South. Let the American people fully appreciate these reasons and their navy's sense of honor and efficiency, which have made it the greatest institution this country possesses, and then let popularity follow in the navy's wake.

This book is a statement of facts. I have written it that others may have the opportunity of acquainting themselves with the truth concerning our navy and what it stands for. Only by means of such knowledge can the people of this country realize what their navy really is and does, and judge more intelligently those "ways of the service" that mean and accomplish so much.

To my friends in the service I trust no apology is needed, except to express a most genuine sense of temerity in treading upon ground so full of pitfalls for the civilian. My only excuse is the ungrudging help, frank criticism, and encouragement which I have constantly received from them both afloat and ashore. To them belongs the credit for whatever technical merits this work may possess; the errors are assuredly my own.

For those portions of this book that previously appeared in *The Navy,* copyrighted under the serial title of "An American Fleet in Being," I wish to thank the editor of that periodical for his kind consent to republication. While some of these chapters have been reprinted without modification, substantial additions have been made to others, and new material has been drawn upon in an effort to present more fully the various phases of the life in our navy that should be known to every true citizen of this great republic.

February, 1914.

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OUR MANY-SIDED NAVY

INTRODUCTION

About the first of January of each year we read in the daily press that the battleships, cruisers, and torpedo vessels comprising the Atlantic Fleet have sailed from their respective home ports for the Caribbean Sea, where, with Guantanamo Bay as a base, their time will be taken up with manœuvres and other exercises until their return north in the early months of spring. Then, no further news, except perhaps an occasional insertion of a few lines when something out of the ordinary has happened.

"But what do they do with themselves?" No wonder the taxpayer asks the question. The last time he saw the ships they were moored for his inspection in a line many miles long off Riverside Drive, and six regiments of bluejackets and marines, six thousand strong, paraded the length of Manhattan Island, to the delight of the assembled multitude. Then, one fine afternoon, the taxpayer went on board a Dreadnought, which, he was told, was more powerful than any ship any other nation then had. He walked the sacred quarterdeck, saw the crew's galley, entered one of the massive twelve-inch turrets, peered into the muzzle of a fifty-foot-long gun,

and perhaps descended into the engine-room. Then he went home. He told his family about it, and described everything he had seen to his friends. When he came to think it over, however—what was it all about? He had been over the entire ship, from stem to stern, from keel to truck, yet his visit had resulted only in a confused impression of guns, machinery, and cramped spaces. Of the "ways of the service" he had seen nothing; of the human side of naval life he had not had a glimpse. His visit to that Dreadnought at anchor within those sheltered waters had been like a glance at a famous race horse or hunter in a box-stall.

"But what do they do with themselves?" No wonder he repeated the question. At the time that he had seen the fleet—the battle-fleet of the navy—both ships and men had been "on a holiday." Only during the few hours of actual review by the President of the United States and the Secretary of the Navy had conditions approximated those of normal naval life. The remainder of the time, officers and men had been on leave, enjoying a well-earned vacation after months of uninterrupted attention to their duty, while only part of the ships' companies remained on board to man the vessels in case of emergency.

But that was now over. The fleet had sailed on its winter cruise—the "busy season" they call

it—one of the two most active periods of the navy's annual program. From the moment the signal boys on the Admiral's bridge had hoisted the flags that spelled the order, "Get under way," every man of the eighteen thousand had had his allotted share of the work to do, and from that minute the success or failure of the next few months depended upon how well each officer and enlisted man performed his small part of the entire task. For, on the day of battle, everyone, from the admiral down to the youngest blue-jacket, has his share of responsibility. However good the gun-pointer may be, unless he has an admiral or captain who can put him in the right place at the right time, good shooting will not avail much.

Four hundred and twenty-five men are actively engaged in the loading and aiming of the main battery guns of one of our largest Dreadnoughts every time she fires a broadside. For the majority of them, target-practice means nothing more than the rapid passing up of dozens of eighty-pound powder bags. Down in the handling rooms and sub-stations, or inside the armored turrets, the men see nothing of the spectacular side of the proceeding, which has so justly been called "the greatest of all games." Only a mere score see the flash, the hurried flight of the projectiles as they curve gracefully through the air,

the splashes caused by their fall into the sea, and the rents in the target-screens. These men are the pointers and trainers, three for each turret, who aim the guns when they are fired, and the spotters aloft, who note the fall of the shot and correct the errors in range and deflection that are apt to occur. Yet success depends as much upon the four hundred and five who do not see what is going on, as upon the twenty who do, and the secret of that success lies in the manner in which each and every man plays his rôle. It is when you think of it in this light that you can appreciate what success means, and understand better than before what the men of the navy do with themselves during the sixteen weeks of the winter cruise and the five summer months that usually are spent in New England waters.

A careful and almost minute training of the personnel is, then, the occupation of the many months spent out of port. Every man is told exactly what to do, and then he is made to do it time and again, until he has mastered every detail so absolutely that he moves instinctively at the first note of the bugle-call.

Monotonous? Yes; but not monotonous on account of undue repetition; for the gradual and systematic training of the battleship's company, which begins with the instruction of the individual, comprises many phases that tend to make

the life on board ship one of much change and variety. Every day the same thing happens, yet no two days are alike. A glance at the last few pages of the "Ship and Gun Drill" manual will reveal this, in the hundred and one bugle-calls that indicate the diversity of the naval routine. Loading drills, fire drills, collision drills, anchor drills, general quarters, torpedo drills, abandon-ship drills—these, and many more, find a place in the busy life of the bluejacket afloat. But with this strenuous and unremitting labor, amusements and recreations are interspersed in numberless ways—concerts, beach parties, boat races, baseball games, and boxing competitions following exercises, practices, and inspections—in order to promote the health and contentment of the personnel, and ensure the battle efficiency of each ship as a unit of the fleet.

But why should the fleet continually have to leave its home port and spend so much time at sea doing what, in the opinion of the average landsman, could be accomplished just as well, and much more economically, alongside the dock in the navy yard? That is what we did years ago. Yes, 'tis true—sad, but true. We did it. But before long we came to realize that the naval officer and the men he commands cannot be made efficient without the constant experience of the sea. The sea itself is the one element of the

seaman's experience that cannot be reduced to book-knowledge. It must be assimilated on the quarterdeck, on the bridge of a sea-going ship at sea, and in the engine-room of a sea-going ship under way. Compare the despatches of the rival English and French commanders in the great naval campaign of the Napoleonic wars, and you will have an answer that needs no further explanation. "To being so long at sea," wrote Nelson, "do we attribute our being so healthy"; and the pathetic words of Villeneuve: "The squadron appeared very fine in port, the crews drilling well; but as soon as a storm came, all was changed. They were not drilled in storms."

Ships, like human beings, have their peculiarities. Those in command and those on board must learn their ways, study their defects, and know how to make use of them properly. "Practice makes perfect," and nowhere is that saying more true than upon the sea. Continuous service produces ease in handling individual ships and whole squadrons, and makes improvements in all exercises that promote efficiency and a proper military spirit. Nor must it be thought for an instant that in thus continually keeping the ships in commission, year in and year out, "the best of their life and efficiency" is ruthlessly taken, or that their boilers and other machinery are uselessly "torn to pieces," as one journal

insistently prophesied when the plan to send our Atlantic Fleet around the world was first suggested. By keeping the ships in service continuously, deterioration is reduced to a minimum. The history of that cruise and of the many cruises since that has demonstrated this beyond a doubt. And this is true not only of the ships themselves and of their intricate machinery, but also of the crews that man them and keep them efficient and prepared.

THE FLEET AT SEA

"La navigation est l'antichambre du combat." *Daveluy.*

The vision of one hundred and twenty-three fighting ships assembled for review in the Hudson River a year ago last fall, lying peacefully at anchor under the shadow of the Palisades, like slumbering genii basking in the mellow sunshine of an October afternoon, did not burst with any shock upon the millions of people who saw that spectacle. It grew, and gripped them as it grew, and its true significance came home to them as they contemplated that steel-clad armada, as sometimes happens when you look at a picture intently.

What a grand sight this peaceful assemblage of the mighty fleet, the most powerful ever mobilized under the Stars and Stripes! How impressive those gray ships, gray from truck to waterline, all perfectly aligned and strung out in three long columns—the larger ships flanked on either side by the smaller craft! Five divisions of battleships there were. Leading each division was a rear admiral's ship, while at the head of the column loomed the *Connecticut,* proudly displaying the blue-starred flag of the commander-in-chief.

The Wyoming's Upper Deck Seen from the Foretop

The citizen layman had been furnished ocular proof of the preparedness of the service and of the efficiency of its organization. And this was due not to the efforts of one man alone, but to the months of hard and earnest labor devoted by the administrative officers ashore, co-operating loyally with their brothers-in-arms afloat.

The organization of our navy into fleets and squadrons has, since the beginning, been guided by strategic as well as administrative reasons, until today we find our vessels grouped in practically the same manner as twenty or even seventy years ago. We have an Atlantic Fleet, a Pacific Fleet, and an Asiatic Fleet, the usual flotillas of torpedo craft and submarines, and Special Service Squadrons, composed of such cruisers and gunboats as may at the moment be required for particular and detached operations. In addition, there are the Reserve Fleets on each coast, composed of all the battleships not attached to the active fleets, manned by reduced crews, yet maintained in readiness for any duty they may be called upon to perform.

With this organization the question arises, "Are those fleets being trained for the ultimate end—to fight their country's battles?" Yes. Until the spring of 1899 we never had a "fleet"; our ships, acting singly, were handled in a way to delight the eye of the most critical seaman;

but, in fleet formation, their manœuvres left much to be desired. Then came a change, and the years of intelligent application that followed gradually bore fruit, until today, the fleet, both personnel and materiel, has been trained to the knowledge and power of what the nation will demand of it in case of war—to fight and win a fleet action.

This is the most important element of the "strategy of peace"—an end, however, ever difficult to keep in sight. The fighting value of the ship-of-war is as dependent upon her proper handling as upon the accuracy of her gun-fire. That efficiency cannot be bought, as can a ship, ready-made; it must be created, manufactured by her officers, and it cannot be created by anyone else. It requires years of work and thought and study. Even then that intimate familiarity with the sea has not been attained, unless its varying conditions have been studied by prolonged service on the blue water. The navigation of the sea is a profession in itself, calling for a considerable technical education, as well as the moral qualities of patience, endurance, discipline, and imperturbable presence of mind. The law of its being demands that the active work of a navy be performed on the sea. All attempts to find for it a sphere of operations elsewhere defy this law, and history has taught us time and again what tragedies have resulted from indifference to

the system that produced the great seamen of the past. One may read and study about handling ships, and this is no doubt a good thing to do; but the way—the real way—is actually to handle the ships under steam at sea. Imagine one's feelings as one sees the evolutions performed by a squadron or fleet of mighty battleships, each displacing from sixteen to twenty thousand tons; and manœuvring, too, in a tumbling sea. Here they are wheeling, there shooting ahead, elsewhere stopping—all at the will and command of the master on the bridge. The danger appalls you, especially in heavy weather; for the failure properly to read a signal, a mishap to the steering gear, or the slight mishandling of a ship, may result in the loss of one or more of them. But such training accustoms both officers and men to the danger, and helps to fit them to meet any emergency that may arise in time of battle, when everything will depend upon the prompt execution of a signal. Morale, leadership, the power of combination, mobility, and fire-power are all links of the same chain, interdependent factors, and success depends as much upon the conduct and support of the assistants, who execute orders of the commander-in-chief and give him advice when asked, as upon the admiral himself.

Without question, the policy inaugurated by

the Navy Department some years ago has had much to do with the present-day efficiency of our active fleets. Regular programs, drawn up by each of the fleet commanders for their respective forces, furnished the officers in Washington, as well as those at the shore establishments, with the information necessary for the furtherance of the progressive work intended. The routine and general work of the fleet and of its divisions and units established beforehand a definite schedule covering every phase of activity, and made for the contentment, as well as the efficiency, of the personnel by eliminating the uncertainty that had theretofore characterized the navy's work.

The Atlantic Fleet of twenty-one battleships, twenty-six destroyers, and ten submarines, with attending auxiliaries and supply ships and colliers, was to operate on our eastern coast, spending the year in such exercises and cruises, in home waters as well as abroad, as seemed best calculated to maintain it in efficient condition. In the Pacific Ocean four armored cruisers, five destroyers, and four submarines were to carry out the usual drills and exercises, and, in addition, make occasional cruises along the west coast to the Hawaiian Islands. And, finally, there was re-established the Asiatic Fleet, which at the present time comprises three cruisers, eight gunboats, two monitors, five destroyers, and six

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THE FIRST DIVISION OF THE ATLANTIC FLEET

submarines, whose most important task is to look after our many interests in the Orient.[1]

Of these three main fleets, the most important is stationed on the Atlantic seaboard. It is here that we have assembled our battle-fleet, the main fighting strength of our sea force; and the advantages the service has derived from this policy are incontestable. The several battleships have been welded into an efficient, mobile unit; their crews have been trained as never before was possible. It is the culmination of years of endeavor and planning, and the policy that has achieved more than any other for real "naval efficiency."

The work of the various fleets, operating in such different spheres of action, naturally differs in many respects. Their work, in the main, has the one object in view—training of the personnel and the developing of the ships into efficient fighting units. In this, their drills and exercises resemble those performed by the drill fleet in the Atlantic Ocean. But here the similarity ends. The various "stationnaires," under which head may be included all the vessels not in the battle-fleet, perform services of a character not usually known to the people of our country. For theirs is the task of keeping the peace locally. In Asiatic waters, our gunboats and

[1] See Appendix II.

cruisers are distributed in Chinese and Philippine ports, from the Yangtse River to Olongapo, ready at a moment's notice to help put down riots, protect the foreign settlements, afford refuge to our citizens, or chase some pirate craft; while on our Atlantic and Pacific coasts the smaller vessels are constantly called upon for service in Central American waters and in the West Indies to suppress revolutions, keep the peace, and enforce the rights of the American settlers. Theirs are the true duties of the "cruisers" in the days of peace—a duty to which even the battleship has at times been assigned, as in Mexican waters in 1913. And most important have those tasks been, since, in the present as in the past, the main part of our diplomacy abroad has ever been carried on by the officers of the navy. Of these services, however, the country knows but little, though there are some particularly notable events, such as our dealings with the Barbary Powers in 1815, and Perry's opening of Japan to foreign trade in 1854, which are known of all who read.

When the American navy has carried the American flag to every corner of the globe, it has not been merely to redeem what the present Secretary of the Navy called "the recruiting pledges of the Navy Department." In the various foreign cruises that our ships-of-war have made,

year in and year out, there has often been a deeper significance, an ulterior purpose, seeking, quietly and unostentatiously, to link to us by ties of mutual respect and esteem, the strangers whom our officers and men met as they sailed the distant seas, carrying American ideas of justice and good government to every land, and rendering to the peace of the world a service not to be reckoned in first-class battleships alone.[2] And in thus sending forth our national vessels for the vindication of the laws of civilization or against any breach of the peace, for kindly and frequent ministration of charity and consolation as well as for courtesy and compliment, our government has but employed the navy on tasks which, since its establishment, have formed no inconsiderable part of its complex duties.[3]

The character of the work performed by the

[2] Speaking of the visit of the American fleet in the Mediterranean last fall, the *Eclaireur de Nice* (France) said, on November 30, 1913:

"Now that the fine American naval division is leaving us, we should like to place on record our admiration for the remarkably good behavior of the crews, not only aboard their ships, where the discipline is strict, but ashore. Altogether they behaved like real gentlemen. Their bearing was irreproachable; their manners showed good education and frequently rose above mere banal politeness. They taught us French, who pay no heed to the Marseillaise, a lesson when they stood rigidly at attention during the rendition of 'The Star Spangled Banner.'

"Secretary Daniels, when he ordered the cruise, did more than he foresaw. He intended to educate the crews, but he also educated us by showing us such splendid ships and men."

[3] See Appendix I.

vessels of the Asiatic and Pacific Fleets and their consorts on detached and special service is, therefore, essentially different from that of the battle-fleet. Mostly small and light vessels, they have always been a heterogeneous lot, acting singly and with little opportunity of being often together for drill. The outlying parts of the world are their cruising grounds; the services they are called upon to perform are as varied as the peoples of the Seven Seas.

To follow the wanderings of each of these "foreign cruisers" would be to open up pages of naval life that, unfortunately, are often known only to the participants themselves. The very romance of the sea would lie disclosed. But such travels would be a digression from the subject of "The Fleet at Sea." It is the Atlantic Fleet in which the citizen is especially interested; it is the work of its twenty thousand men he would come to know, because it is the work of our drill fleet, our battle-fleet.

The drawing up of an annual schedule, such as has been mentioned, involves much thought and care, since the amount of time allotted to each of the forms of work depends upon many factors, each having a direct bearing upon the final result. Yet this variety of activity is such that it makes for the improvement of the service in its readiness to meet exacting conditions and to suffer

no surprise or shock or deterioration when confronted with a really serious emergency. In this nothing has been of more material assistance than the very definite, yet different, localities which the battle-fleet has had at its disposal as operating bases for the two main periods of its year's work. During the winter, Guantanamo Bay has come to be recognized as the ideal rendezvous for the work of the "busy season," while in the warm summer months, Narragansett Bay has been preferred as fulfilling the requirements of an operating base better than any other site on the Atlantic seaboard. In the interval between these two periods of exercises, manœuvres and fleet training, the work of the several separate divisions is scheduled, target-practice is held, and the home yards are visited for the purpose of docking the ships and of granting liberty and leave to both officers and men. It is at these times, in the spring and fall, that our great central military base at Hampton Roads is visited by the vessels of the fleet, and the last touches put on the past month's work just previous to target-practice, which, in the opinion of all, is the "grand finale," the "greatest of all the games" the navy plays.

It is New Year's Day. The assembled fleet has been at anchor at the appointed rendezvous during the past fortnight; every man has received

a week's leave to spend the Christmas holidays with his family and friends. All liberty-men have returned on board. A signal is flying on the flagship. Steam is up on every vessel, boats hoisted in, and gangways shipped. On the forecastle, the boatswains are supervising the work of the forward divisions with the anchor gear; the leadsmen are in the chains;—the engines begin to throb. Then with the flagship of the commander-in-chief leading the way, the fleet steams out into the channel, the battleships so alike, to the landsman's eye, as to defy identification. It is an impressive manœuvre in the crowded harbor waters—awe-inspiring even to the oldest tug-boat captain as the Dreadnoughts sweep by, one by one, at the regulation five hundred yards interval.[4] Thus the vessels pass out to sea; their prows are turned to the southward. A last glance at the hospitable shores and work begins again.

While the seventeen floating fortresses—four divisions of four ships each and the flagship of the commander-in-chief—keep close together, steaming in a single column over five miles in length, the smaller vessels and torpedo craft are "all over the shop," as they familiarly put it, getting their scouting abilities into trim.

[4] This is the distance from foremast to foremast; the distance of open water between ships, then, narrows down to 250 yards.

Battleships Making an "Approach"

Weather? The true sailor does not bother about the weather. Quite a sea may come up, but the battleships take no heed of it; occasionally they may indulge in a lurch, an unrhythmic pitch, but their motion, as a rule, is so small that no one thinks of securing anything below decks. Suddenly a string of bunting runs up the flagship's mainmast. A quick command from the officer-of-the-deck, the hoarse summons of the boatswain's mates, and all seems "confusion." Confusion it may seem to the casual observer, but to the trained seaman it is an orderly rush, in which each man on board is doing exactly what is expected of him without getting in anyone else's way. Every detail called for by the "station bills" is being scrupulously attended to, and these duties for the time being demand each man's attention, yet without needless complication through having to think of another man's work. In and out the fleet is twisted, doubling this way and that, first stringing the ships out in one long column, one after the other, then forming them up in line abreast of each other—all at the will and command of the admiral of the fleet, its brain and master.

The work is hard, exacting at times; but the interest of all is so unflagging that the greatest benefit is derived from every evolution. And no little factor as a begetter of efficiency is the spirit

of competition which has been aroused not only between the several divisions and individual ships, but even among their officers and men. Its benefits have been extended in every possible direction, with such results that it has proved the most powerful influence toward the attainment of the desired end. Evidence of this has already been shown in the steadily increasing tendency to make the ships self-sustaining,[5] and in the excellent record they have made in the preservation of their materiel and economy in its operation. These facts, no less than the rarity of serious accidents, have demonstrated beyond a doubt their high state of efficiency.

It is impossible, of course, in times of peace to reproduce all the conditions of battle; only a suggestion of the "real thing" can be had. But,

[5] The emergency repairs made on the destroyer *Burrows* in 1913 at Guantanamo Bay, where there are no shops or repair depots, are sufficient evidence of what the American bluejacket can do with scant facilities and few tools at hand. In a collision twenty-five miles off shore that vessel's bow was twisted and badly crushed. Yet in twenty-one working hours the bow had been entirely cut off and rebuilt by her crew, assisted by details from the *Dixie* and the *Monaghan*, and the vessel was reported ready to take her place in the fleet and run at any speed. And only last fall, our battle fleet gave a practical demonstration of self-dependence, such as the country had not witnessed in years, when the vessels making the cruise to the Mediterranean steamed nine thousand miles without purchasing an ounce of coal or provisions. The fleet's own colliers and supply ships furnished everything needed during that seven weeks' absence from home, and some of the refrigerating ships even brought back part of the cargoes with which they had started.

on the other hand, it cannot be said that nothing is being done to overcome this difficulty. Immediately after the assembling of the fleet at any of its bases, systematic efforts are made to familiarize the units with battle tactics. Certain days of the week are set aside for fleet exercises—"battle plan," they call it—on each of these mornings at daylight the ships get under way, and, after steaming to sea beyond the three-mile limit, spend the day manœuvring. Sometimes two squadrons of equal force are ordered out to solve problems of "search"; umpires on each vessel keep a careful record of all movements; and, in the case of an engagement, decide the fate of the individual units. It is excellent practice for the officers. They know the rules and what these call for, but the initiative is all their own, and theirs the opportunity of handling squadrons as in actual battle. Imagine what would happen were these rehearsals not held. The handling of the battleship from within the conning-tower is no child's play. The captain's sole view of both friend and foe is through the tiny slits in the armor of his steel-walled conning-tower; his range of vision extends only from ahead to a little abaft the beam; he cannot read the signals himself, for he cannot use his glasses with any degree of certainty. The commanding officer's location is a new one. But the battle

of Santiago taught the need of practice, and well has that lesson been learned. In battle, quickness of action and precision are of prime importance, and by rehearsals these qualifications of the "brain" of the ship and of the "brain" of the fleet are developed and trained.

Were it possible in war to confine all hostilities to the daytime only, the navy's problem of preparation would be decidedly simplified. But the age when the enemy formally announced his intention of attacking is long past, and we are confronted with the possibility of night attacks and surprises even in the most unexpected places. For this reason much of the fleet's work has to be devoted to training the personnel for such a contingency. And here is where some of the most spectacular and interesting work of the navy comes in.

It is a clear, still night; only the guiding stars in the heavens are shining; not another glimmer is visible. The fleet is steaming in single column, with only two hundred and fifty yards of clear water between the ships. All dead-lights are screwed down over the port-holes; not a ray of light shows about them; not even the running lights are uncovered. The effect is awesome. The ship directly ahead is swallowed up in the immense darkness of the sea and sky. Your eyes try to pierce the inky blackness for an occasional

glimpse of the tiny shaded light at her stern and the swirl made by her screws or the straight tracery of her skeleton masts as they cross the stars. Astern, only a couple of cable-lengths off, is another ship forcing her huge mass after you, her ram cleaving its way through the water unrelentingly. Yet so perfect has the training been, so well drilled is the fleet, that the interval between the ships never varies, and on they speed, as if tied together. Suddenly the *ardois* signal-lamps on the flagship begin to wink; flashes of red and white lights pass aloft from ship to ship. A momentary pause. Then a great beam of light shoots across the admiral's bow. Instantly ninety-six other beams dart into the air, sweeping the horizon and illuminating each crest of wave. It is a searchlight drill, designed to teach the crews the use of one of the battleship's greatest protections against a torpedo-boat's night attack. "Only a patch compared to the real thing"—a mere taste.

So the "preparation" goes on. Every phase of the battle exercise is studied, rehearsed, and perfected. It is the only way of becoming familiar with the conditions that will exist on the day of battle.[6] And be it said to the credit

[6] How history repeats itself is once more brought out in the recently published work on the Russo-Japanese War, *The "Novik" and the part she played in the Russo-Japanese War, 1904,* by

of the service that the energy and enthusiasm of its officers have been a great factor in bringing out this realism so successfully. The fleet has never been in as good condition as it is today. It is prepared. And is not an additional reason for this to be found in the obedience, contentment, and intelligence of its enlisted force?

Lieutenant A. P. Steer, I. R. N., in which the author thus comments on the importance of maintaining a "fleet in being": "Although it went against the grain, we could not help admiring the evolutions of the Japanese squadron outside Port Arthur: never the least hesitation, never a mistake. Compared with this, what must have been Admiral Makaroff's feelings when he wanted us to take up our fleet formation? The signal was hardly down before things were at sixes and sevens, and two battleships, which had not understood what was required of them, promptly rammed one another. And yet one could not in reason expect these captains to know that which no one had ever taught them. When it is a case of handling a battleship in a squadron, while performing evolutions, mere theoretical knowledge is of no use, even in the most simple cases. What is required is constant practice at sea, and that is precisely what we all lacked. The admiral had first thought of providing us with this, but he seemed to have thought better of it, for fear that his precious battleships might sink one another."

THE NAVAL STATION AT GUANTANAMO BAY

The interests of nations in the sea are almost wholly interests of trade and commerce, and the importance of parts of the earth's surface vary from time to time, therefore, as the means of communication are developed or extended. For centuries, the Mediterranean Sea was the center around which gathered the influences of the civilized nations of the world; for ages it was the one route by which the West and the East maintained commercial relations. With the discovery of the passage by the Cape of Good Hope, a fresh incentive was offered to the venturesome navigators of Europe, while at the same time the discovery of a new world opened up to them a new sphere of ambition. The longed-for East, however, was not yet within reach; a narrow strip of land still separated the discoverer from the "South Sea."

With the completion of the Panama Canal, the vision, dimly seen by Columbus through the scanty and inaccurate knowledge of his age, has come true. The continent that so stubbornly barred him from the distant Eastern Ocean has at last been pierced. A trade route through the

Caribbean to the Pacific has at last been opened, and a passage has been completed at which all the highways between the Atlantic and Pacific Oceans will hereafter focus and intersect.

It is most fortunate for the United States that she is in possession of an advanced base in the waters controlling the approach to this great highway; for among the great powers of the world, no other nation is so vitally interested in its protection. For years, the most advanced station that the United States had fully developed was Key West. Its value to the squadrons operating in Cuban waters during the Spanish-American War cannot be overestimated. But it was not ideal; it was not advanced enough. The opportunity of bettering this position, however, came soon. One result of the hostilities with Spain was the gaining of a naval station still nearer to that greatest strategic center of the Caribbean—the Canal. Culebra became ours by political possession, while the acquisition of Guantanamo Bay was made possible by the agreement entered into between the United States and the Republic of Cuba, in the summer and fall of 1903, whereby that spacious harbor with its surrounding lands was ceded to our government "for coaling or naval stations."

A glance at the chart will illustrate the superiority of those newly acquired bases over any

On the Southern Drill Ground

which the United States had heretofore possessed in those waters. In situation and in natural elements of offensive and defensive strength, Guantanamo Bay and Culebra far surpass any of our Gulf ports. As strategic points for the effective defense of our own Atlantic and Gulf coasts, as well as of the South Atlantic and the Caribbean, none can compare with them. They virtually command the approach of a hostile fleet through the Yucatan, Windward, and Mona Passages, and as bases for operations present advantages not found elsewhere. In short, Guantanamo Bay and Culebra can become to the United States what Gibraltar and Malta are to Great Britain in the Mediterranean and at Suez; with the further advantage to us that they are nearer to our home ports than those positions are to Great Britain.

Up to the present time, however, we have not been obliged to prove in practice what in theory we have already determined to our own satisfaction. Years of peace have enabled us to make use of our new naval stations for a different purpose. It is the great importance of Guantanamo Bay in this latter respect that we shall now consider.

Guantanamo Bay is a splendid sheet of water. Miles long and miles wide, it furnishes a commodious harbor, capable of accommodating at

anchor a fleet of thirty-five battleships, with sixteen more in the outer harbor, if necessary. For beautiful scenery it is unsurpassed. Imposing bluish mountains in the background on all sides, smaller promontories in the middle ground, and low shores in the foreground, surround the large land-locked bay. The coloring is gorgeous under the clear, tropical sky; the water, rich ultramarine blue, greenish-yellow, bright green, or even dull brown. What more ideal setting could be imagined! Yet with all its beauties, it has the shortcomings usual to the tropics. The shores are bleak and desolate; not a road (except one through the naval station) pierces the wild undergrowth of tall grass and cactus; not a habitation is to be seen for miles; the nearest settlement is Caimanera—at the head of the bay, outside the reservation—with its lazy, dirty, and worthless crowd of mulattoes, while the city of Guantanamo, about seventeen miles inland, is practically inaccessible, owing to the poor railroad communication.

Around the outer bay is scattered the naval station, comprising the station-ship, a shore office for the commandant, a general store, a coaling station, and a few frame structures for the accommodation of the officers and men on duty there. A redeeming feature of the place is the officers' club and the enlisted men's building, with

their large verandas, where the cool trade winds may be enjoyed to advantage. Nor is that all. Extensive construction work has been actively prosecuted during the past few years to carry out the comprehensive scheme planned by the Navy Department to make Guantanamo Bay what it should be in order to render the best service to the fleet. A station wharf, a fuel-oil wharf, a number of oil tanks capable of furnishing an adequate supply of fuel for the ships, and a pipe line from the tanks to the wharf have been constructed. A power-plant is to be erected, where emergency repairs may be made, although such repairs will necessarily be limited to those that can be made on a ship not in dock, since it has been found impossible to complete the dry-dock originally planned. And last, but not least, a wireless station, with two 250-foot self-supporting steel towers, is, before long, to be completed.

One look at the reservation as originally laid out, however, clearly reveals the distressing fact that in the beginning we did not acquire land enough. The station is too small for the purposes intended. To the eastward and well within the range of a six-inch gun rises a sharp promontory, which was generally referred to as "203 Metre Hill" because of its commanding position. An enemy could without much difficulty, land his guns at the base of the mountain, and in a short

time mount them in a position from which everything of value about the bay could be destroyed.

That the Navy Department might not be kept in ignorance of a situation so alarming, the officer then commanding on the station, the late Rear Admiral Robley D. Evans, appointed a board of able officers to report on a solution of the problem. This board made an exhaustive report, after having covered the ground, climbed the mountains, and surveyed the possible sources of water supply—for be it known that the water supply of our naval station is wholly inadequate, although there is a fine river running through the country but a short distance off; every drop of fresh water for the station has to be brought from a point ten or twelve miles inland in water cars, after which it has to be pumped into waterboats, which are towed six miles before it can be distributed for consumption. The unanimous recommendation of the board was that the boundaries of the concession be extended to include the high point necessary to its proper defense in time of war.

"This report was duly forwarded," wrote Rear Admiral Evans, "and that was the last we ever heard of it. The Assistant Secretary of the Navy came down later, looked the ground over, and approved of what had been done. Later still, a committee of senators came. After spending

one hour in the bay, they sailed for Jamaica, deciding that no more money should be spent on Guantanamo, and so the matter stands to-day. We cannot do the work without money, and Congress will not appropriate the money."

Since those words were penned, however, something has been done. The reservation is to be enlarged sufficiently to meet all requirements, and the prospect of its proper development in the future will be assured if only our Congressmen and their constituents can be made to realize that the navy exists for the nation and not for the sole benefit of the various localities where our all too numerous home navy yards now happen to be situated.

At present it can be truthfully said that Guantanamo Bay is of vast importance to the United States as a training station—a position from which, as a safe anchorage, the battle-fleet may manœuvre and conduct its exercises with the greatest possible advantage. Owing to its climate during the winter months, it is by far the best place available. It is even more; it is better than any other place the navy could select, were it given a choice in the matter.

The large bay offers opportunities to the real sailor that none in the fleet can overlook or fail to take advantage of. Every day thousands of bluejackets may be seen crowding the gun-walks

and boat-booms, in order to be the "first in" when swimming call is sounded before breakfast and again before supper. The desire of every man on board is sooner or later to accomplish the feat of swimming "round the ship." Those who cannot keep afloat are assigned competent instructors, and every afternoon pupils and masters are sent to the sandy shores of Hicacal Beach, within the waters of the bay, where the regular hour-a-day is well spent and the lesson thoroughly learned.

When the men have mastered the art of looking after themselves while in the water, practice is given them in the handling of small boats. Sailing launches, whale-boats, cutters, and dories are time and again ordered away under oars and under sail, and there are moments when one is reminded more of the regatta days at Marblehead than of the warlike training that calls the fleet to the Caribbean.

Nor are these the only exercises possible within these sheltered waters. Every ship in turn holds such important drills as abandon-ship drill and collision drill. Various seamanship feats are executed, as in the case of an anchor drill, when the heavy "mud-hooks" are carried out in one of the sailing launches and again hoisted in—a difficult task and one calling for expert knowledge. In the mean time, the ships' landing forces

have rehearsed the various stages in the disembarking of large armed detachments, and their flotillas have gained practice in evolutions held under actual service conditions. At the same time, the torpedo divisions may be seen inshore planting their mine fields and testing their torpedoes. Thus the work goes on; every opportunity offered by the sheltered waters of that wonderful bay is fully taken advantage of.

While these things have been going on afloat, on shore over a thousand bluejackets and marines have been living under tents on Deer Point, a high bluff on the eastern shore of the bay. One object in thus going into camp is to teach the men the gentle art of "soldiering" and to enable them to use the small-arms target range to its utmost capacity; for Guantanamo Bay boasts the finest small-arms range in the world. True, the natural features of the country left nothing to be desired; but the Bureau of Ordnance, to which fell the task of perfecting what already existed, nevertheless deserves great credit for its indefatigable exertions in completing the work. Over two hundred targets, for all ranges from fifteen to one thousand yards, for pistol, rifle, and field-gun practice, for slow, rapid, and skirmish firing, have been erected under the low-lying Cuzco Hills that screen the reservation from the sea to the eastward.

Day in and day out, from sunrise to sunset, hundreds of men crowd the firing points. The noise is incessant, the reports of the Springfields following each other so rapidly that one might almost imagine a battle in progress. And then, from over the hills, not half a mile away, comes the boom of the artillery; while on the other flank the rapid fire of the skirmishers may be heard as they "do their runs." More than six thousand men fire the prescribed course during the months that the fleet is in Guantanamo Bay. As many as three-fourths often are qualified as marksmen, sharp-shooters, and experts. Every man is keyed up to the highest pitch, and every man is there to win. The competition is not only between individuals, but between divisions, ships, and squadrons. Rewards and "prize money" also are at stake.

There is no doubt that the navy at Guantanamo Bay enjoys the use of the finest small-arms target range in the world, and it may be justly said that the use of this range enables the men of the service to outshoot all competitors. It is here that they receive the training which places them in an enviable position among the crack shots of the world. For to their credit be it remembered that on the cruises of the Atlantic Fleet the blue-jackets won from the best teams in Australia, Japan, and Europe.

Pitching Tents on Deer Point

It is obvious, then, that as a training station Guantanamo Bay is indispensable to the navy in time of peace. It furnishes what no single one of our home ports affords—a proper base and sheltered harbor, where the Atlantic Fleet, the battle-fleet, may uninterruptedly carry out its program of manœuvres, exercises, and drills during a season of the year when the rigorous climate on our Atlantic seaboard would seriously hinder any such work. It is the one place where the real work of the navy can be and is carried on. But it is also, unfortunately, so located that the people at home cannot form a correct idea of its importance, because this work has to be carried on outside their own sphere of observation. The navy has, by experience, learned to appreciate the value of Guantanamo Bay; let us hope that the day is not far distant when the people also will be able to realize its true relation to the service and to the nation.

THE ORGANIZATION OF THE SHIP

To the soldier, the naval organization on shipboard must at times seem a curious combination of the military, the nautical, and the mechanical. The profession of arms has, in the course of centuries, been blended with the skill of the seaman and the craft of the artificer, until the mingling of the three has resulted in an institution that, for thoroughness and efficiency, is nothing short of marvelous. For, like almost everything else on board ship, the present organization is the result of an evolution from the days of the row-galley and the sailing frigate; so much so, that, as Sir Cyprian Bridge remarks,[1] "A knowledge of naval history is indispensable both to the administrator who may have to devise a system of organization and discipline and to those who may be called upon to work the system in actual belligerent operations."

From the day that the White Squadron first sailed the seas, the United States Navy has experienced a period of transition. The changes at first came slowly and very gradually. Then came the War with Spain; and one result of that

[1] In his *Art of Naval Warfare*, p. 9.

successful conflict was the bringing of the Service within sight of a final solution of the great problem of organization, sooner, much sooner, than would otherwise have been possible. For, as can readily be understood, there exists in the navy a veneration for practices conserved by long acceptance, a respect for old customs, that cannot be speedily set aside by any novel device. Such deference is characteristic of the Anglo-Saxon, and is a feeling that is planted deep in the heart, as well as in the intelligence, of the American bluejacket.

But tradition sometimes ceases to represent the living present. It may become an adherence to a dead past, the ideas of which have been outgrown. Change is imperative. An advance must be made. This was the situation in which the Service found itself just previous to the 15th of February, 1898. The shock of battle then was the entering wedge so long needed. A great departure was made in the enactment of the Amalgamation Law of 1899, whereby the old Engineer Corps of the Navy was transferred to the line. It was a radical violation of naval tradition, but the last fifteen years have demonstrated the wisdom of such an unusual measure, and the remarkable gain in the efficiency of our fleets since then has justified the innovation beyond a doubt.

If the crew of a man-of-war had but one thing to do, their development into an efficient fighting strength would be easy of accomplishment. But they have not. They have battle by day and battle by night, cruising alone and in company, besides the many minor duties comprised in cleaning ship, boat drill, coaling and fueling ship, gymnastic exercises, and mine-laying drills, in addition to the soldier's duty of the manual of arms and field-gun exercises. All these, and many more duties they have to perform. Of course, in none of them are all the officers and men always included, nor is it necessary that they should be. But each task has, and must have, a "specialty nucleus," with its supervisor and staff; and it is this provision of the naval organization, this point of support for the deck hand, the "general worker" who has to turn his hand to so many different things, that has been such a factor in welding the crews into their present efficient state. Common-sense principles rule, and their application is found in the station bills that form the *vade mecum* of every officer afloat. Once the ship's organization has been adjusted, once the shaking-down cruise has been completed, every man of the thousand on board knows his duty under all conceivable contingencies, and the display of a signal from the flagship's main is all that is needed to start the machinery of

that well-regulated organization to the ordered, confusionless end.[2]

It can be imagined what, under these circumstances, the responsibilities of the head of such a community must be. The "solitary chieftain," he has been styled. And appropriately so, for his generous quarters on board are entirely separate from those of the other officers. He usually messes alone, and at his cabin door paces a marine sentry, night and day guarding the entrance to the *sanctum sanctorum,* lest anyone should enter without the usual formal announcement. Upon "the Old Man," as he is irreverently called, falls the responsibility for everything—discipline, safety of ship and men, and work of every kind. He has the general superintendence over the affairs on board, and all orders of a general nature are supposed to emanate from him. Upon all professional points his decision is final. He is the guiding spirit of that giant instrument of modern naval warfare, the Dreadnought, the one whom all look up to in time of stress and in the hour of battle.

But besides being the naval and military chief, the captain has to be master of another profession, which calls for a knowledge of the law and of human nature in all its aspects. For not only is he the commanding officer, but also a

[2] See Appendix III.

lawyer, a kind of justice of the peace. "He is a Leviathan," wrote the scurrilous Ward[3] in 1708, "or rather a kind of Sea-God, whom the poor tars worship as the Indians do the Devil." In those "good old days" he had power over his subjects almost to the life. But since the navy "went to the dogs," the day that flogging was abolished, the discipline of the Service has undergone a great change. The men are well cared for, well housed, well fed, and looked after in ways never thought possible in the old times.

The principle by which discipline is maintained is no longer to punish as severely as possible, but to offer the men every inducement to do right, so that they cannot fail to see the advantages to be gained by good behavior. Every morning at nine the captain holds his court at the foot of the mainmast. He is court, judge, and jury, and in this treble capacity he examines the reports of the transgressors. "What have you to say?" he asks. The offender always has an excuse, but unless it bears evidence of acceptability, punishment, swift and sure, follows the offense, and the spirit, as well as the letter, of the Navy Regulations is effectively carried out. It is a simple

[3] In his book, *The wooden world dissected, in the characters of a ship of war, a sea-captain, a sea-lieutenant, a sea-chaplain, the master, the purser, the surgeon, the gunner, the carpenter, the boatswain, a sea-cook, a midshipman, a captain's steward, a sailor, etc.* By a Lover of the Mathematicks. London, 1708.

and efficacious manner of dispensing justice. Nowhere is arbitrary authority—which the sea compels, aside altogether from the question of military discipline—exercised with greater intelligence and humanity, or with more consideration for the rights of the individual man, than in the Navy of the United States, and the cases are few indeed in which the offender may rightfully think himself unjustly dealt with.

Next in rank to the captain is the Executive Officer, "a sort of captain's proxy," says Masefield, "who did all the work, in order that the captain might have the glory." And broad indeed must be his shoulders and serene his temper. For as the personal representative of the captain in maintaining the military and general efficiency of the ship, he has the direction of everything on board. To him every question is first referred. All the heads of departments and all other officers, and everyone of the thousand men on board, are directly under his orders. He must organize and drill the ship's company, and look after the daily routine and general work. He must care for the ship, inside and out. His office hours are from early morning until late at night, and his only moments of leisure may be said to be the few he spends at the head of the wardroom table, at meal times, presiding as social arbiter.

So many, in fact, are the Executive's duties, that a few years ago a new "personality" was created on shipboard in the quality of First Lieutenant, upon whom devolved the responsibilities of the vessel's "cleanliness, good order, efficiency, and neat and trim appearance." Extreme tidiness is a characteristic of the American man-of-war. "A place for everything, and everything in its place"; this cardinal principle must the "fust luff" continually bear in mind as he makes his frequent inspections of the countless compartments, double-bottoms, bulkheads, valves, pipes, and everything above and below decks.

Such is the complexity of the ship-of-war, and so great the need of "specialty" supervisors, that, even in the days of old, there existed positions of responsibility other than those filled by the officers thus far described. For, since the ship is a "home" in which dwell and labor the thousand men who man her, a "home" which must, at times, move from one end of the world to the other, certain elements enter into her management other than those above enumerated. Her controlling spirit is the Captain; her administrator, the Executive Officer; and her housekeeper, the First Lieutenant. But, in addition to these, there must be one officer continually in charge on the bridge, the Officer-of-the-Deck;

Photograph by G. V. Buck
from Underwood & Underwood, N. Y.

FOUL WEATHER

someone to look after the health and comfort of her crew, the Medical Officer; and one charged with their clothing, feeding, and pay, the Pay Officer; another to see to their spiritual wants, the Chaplain; and an officer to command the Marine Guard, the Captain of Marines. Then the ship must be safely guided in and out of harbor and across the waters of every sea, which duty can be attended to by but one, the Navigator; her motive machinery and heating and lighting plants come under the direct superintendence of the Chief Engineer, who rules over a sort of world all by himself; and last, but far from least in importance, comes the Gunnery Officer, upon whom rests the responsibility of the ship's battery, the training of the gun-crews in the work of target-practice, and their preparation for the day of battle.

These heads of departments, with their immediate subordinates, the division and watch officers—which include all ranks except ensigns less than two years out of the Naval Academy—comprise, socially, what is known as the Ward-room Mess. Their quarters are comfortable, but by no means luxurious, and here they assemble at meal hours and drop in for a moment or two when off duty. The Government supplies the officers with their furniture, china, glassware, and table linen, but not, as is generally supposed, with

their food. Until some fifteen years ago, Congress still allowed each officer and man the sum of thirty cents a day for rations; but a sudden spirit of economy caused them to cut off this allowance from the commissioned officers above the rank of midshipman, and that Act has meant to each one a net loss of about $110 a year, which, while never sufficient to supply all the food, yet defrayed no small share of the expense. However, ingenuity was not lacking in meeting this new condition of affairs, and a system was soon devised by which good, simple fare, and plenty of it, might be obtained at moderate cost to the satisfaction of all. It is only when the ships are sent on foreign cruises that a real burden is thrown upon the officers; for, unlike other countries, our Government does not allow a penny of "table money" for official entertainment.[4] An English admiral's allowance for this item is usually $6,000; but, in the United States Navy, such expenses come out of the officers' own purses, and the figure, as can be imagined, is never an inconsiderable one.

The organization of the other messes is similar to that of the Wardroom Mess. In the "Steerage" live the Junior Officers and the Marine

[4] Compare our parsimony with the attitude of the German government which, in addition to his regular pay, allows each naval officer almost thirty dollars a month for food and eleven dollars more for wines and beer.

Lieutenant; in the Warrant Officers' Mess, the Warrant Officers; and in the Petty Officers' Mess, those of the enlisted men who, by diligent and faithful service, have won promotion and part of officers' privileges.

"Forward of the mast," in nautical phraseology, but, in the newer ships, actually in the region of the quarter-deck, lives the enlisted man, the "man behind the gun." The "deck" is his home, the scene of his many activities, and his playground. His life, it is true, is very different from that of his brother on shore; but his standard and his attributes are such that he makes the best of the adverse conditions under which he lives—all sea conditions are abnormal to the average man—and does his work cheerfully, willingly, and well. Even our island friends across the Atlantic have come to acknowledge this, and during the past few months have had some of their distinguished naval officers on our shores visiting our latest warships, on board of which "the provision made for the comfort of the men of the lower deck is undoubtedly superior to that which obtains in British vessels." "The visit," said the English periodical, *Truth,* "ought to have practical results for British sailors. The *Orion* class carry a complement of 800. The *Wyoming* carries 1,115. If the Navy Department at Washington can get 315 more men

into a ship, on an increase of nine feet more length, four and three-quarters feet more beam, and one foot more draught, and at the same time house and sleep them much better, they have certainly something to teach us."

In the organization of the enlisted force, the men are classified under four different heads,—seamen, artificers, specials, and messmen. These are divided into petty officers and men of inferior rating, and each of these groups is again subdivided into three classes. When the apprentice enlists he is immediately put on the payroll at $17.60 per month. After four months at the training station, if he passes his examination as ordinary seaman, he goes on board ship, which means an increase in his pay of $3.30 per month. One year after this date—provided, of course, that he again passes the required examination—he is advanced to the rating of seaman, first class, at $26.40 per month.

The enlisted man's items of expense, during this time, are few in number. He must pay for his uniform, after the initial outfit which the Government gives him free of charge. He is required to pay for certain "small stores," to meet his barber's bill (that luxury costing him a dollar a month for one haircut and thirty shaves), and to keep his clothes clean.

Other than these, his expenditures are entirely voluntary.

Besides the regular pay and allowances, the enlisted man has many opportunities of making extra money. Continuous service, re-enlistments, and good-conduct medals add to his regular pay sums ranging from 83 cents to $5.50 per month. If the honorably discharged bluejacket re-enlists within four months, he is entitled, as bounty, to four months' pay. Such extra duties as being coxswain of a steam launch, serving in submarines, having charge of store-rooms, doing duty as messman, being detailed as signalman, serving as mail clerk, or acting as gun-captain, swell his purse considerably. And to these may be added the $100 bonus and medal of honor that the Navy Department awards on the recommendation of his commanding officer for extraordinary deeds of heroism performed in the line of duty.

To the ambitious young man, the Service presents bright prospects of promotion. From the moment that he has reached the rating of first-class seaman, the enlisted man is eligible for advancement to third-class petty officer, at $33 a month, as master-at-arms, coxswain, gunners' mate, or quartermaster. In another year he may become a second-class petty officer; and, after twelve months in that rating, he can be promoted

to first-class petty officer. This brings the candidate within reach of a chief petty officer's appointment, which, after a year's creditable service, becomes permanent and irrevocable, except by court-martial. Men have been known to attain that $77 appointment within a comparatively short time. Advancement depends only on their own willingness to work to win promotion; and it is the exception rather than the rule that a bluejacket does not win his petty-officer's stripes within the regular four years' enlistment, or at the outside in six years.

Even then, the goal has not yet been attained. For, to the enlisted man, other chances are offered and, if he wishes, he may next strive to win the rank of warrant officer and, eventually, a commission as ensign. It takes a man of unusual ambition, however, for days of study and self-denial must be devoted to the task if the necessary examinations are to be passed. But if he wants to succeed, he will find no lack of interest and help in his efforts. His division officer is only too glad to facilitate the solution of some problem with an explanation or to suggest some easier method of procedure. Textbooks on every subject are at his command in the ship's Crew's Library, and the correspondence schools on shore may, at times, be of assistance to him. The opportunity for promotion is

Off Duty

there; it depends upon him alone whether he will succeed or not.

But it is in the various fundamental drills on shipboard, those essential exercises for the welding together of the ship's company into an efficient unit, that the broader phases of the organization usually reveal themselves. The inter-relation of the several separate departments then for the first time becomes apparent, each losing its particular individuality as it becomes merged into one of the two great divisions under the direct supervision of the gunnery officer or engineer officer. The battle organization of the ship-of-war has become perfected. The crew are at general quarters. The navigator is inside the conning tower; the watch officers are at their stations in the battery or with the fire-control party; the members of the pay department have taken their places in the substations and are in charge of the telephonic communications; the marines man the torpedo-defense guns; the messmen and cooks are ranged in line in the handling-rooms and passages ready for their duty in keeping the guns supplied with ammunition; the carpenter and his gang are below to repair damages received in action; the electricians are scattered about the ship, wherever they are most apt to be needed; the boatswain for the time being loses his identity as the

seamanship expert of the ship; the sailmaker has reported to the ship's medical officer for duty in the dispensary. Each and every man has his appointed station in the military organization of the ship, no matter what his rank, rate, or other duty.

Unlike the deck force, the engineer department has but one task to perform, but one duty—the maintenance of the ship's engines and boilers. The "motive-power factory" it has been called, and rightly so, since every member goes to work in the same place every day, under the same "bosses," following the same directions from above. Sometimes a "hand" is cleaning a station, sometimes repairing it, and sometimes operating it. But it is always the same station, practically speaking. When their spell of work is over, the "hands" wash up, and go "home" to the ship, just the same as any other factory hands do. Here we find the machinists, the water tenders, the firemen, the boilermakers, the oilers, and the coal passers—each with the same ratings and divided into the same classifications of petty officers and seamen, with corresponding pay, and with the identical opportunities of promotion, as their shipmates of the deck force.

What is essential, however, in this process of producing belligerent efficiency, is the relegating of everything to its proper place. The routine

on board, the nature and the extent of the drills, and the apportioning of the ship's work must be governed by an intelligent application of the means available for the end sought. The non-essentials must be put aside, the heirlooms of the past dispensed with. We cannot do without drill. It is a necessary evil. It aims at, and in the end produces, uniformity and, therefore, the attainment of team-work and ultimate perfection. It demands hard and exacting work, and it demands this for the training of the crew as well as for the maintenance of the ship. Nor do the men object to it. They realize its importance and evince an interest in every useful drill, knowing full well that once a drill has been done well they will be called upon to repeat it only occasionally, or often enough to keep them properly familiar with their stations and duties in time of necessity. Not all the drills are held each day. On one, "Great Gun Drill" may be held, when the deck divisions are exercised in manning the battery and put through all the motions of loading, pointing, and firing the guns. On another, those detailed to the ship's landing force may be put through the manual of arms with rifles and taught the "School of the Soldier," since the occasion often arises when the bluejacket has to perform the service of an infantry-man and light-artillery-man on shore; while "Fire Quarters" have to

be held from time to time to prepare for such a contingency, for, should the crew be untrained, a terrible disaster might some day occur.

Besides these, there is also the "Collision Drill," in the course of which all water-tight doors and hatches are closed, and collision mats lowered over the imaginary holes in the ship's side, while the hands unoccupied with these details remain at their stations in case there should be a call for abandoning ship, when each man has his place and allotted task in the provisioning and arming of the small boats. When "General Quarters" are sounded, all hands take their stations at the guns and below decks for fighting the ship; "Clearing Ship for Action" consists in clearing the upper decks of all unnecessary rigging and other material, and lowering away the ship's boats so that all danger from splinters in time of battle may be minimized as much as possible; and "Coaling Ship" occurs whenever the supply of fuel in the bunkers is getting low. This last is the most arduous work the crew of a man-of-war can be called upon to perform. Strictly speaking, it is not a drill, but its importance in time of war is such that carefully organized methods in coaling have come to be considered of prime military necessity.

These are the "fundamental drills" of the modern ship-of-war as affecting her efficiency and

the welding together of her crew into an effective unit. In all is the interest of the men stimulated and fostered by a spirit of clean competition, and as they understand their meaning and read the bulletins showing the standings of the various ships their enthusiasm becomes more real. Every man comes to appreciate the importance of his own small share in the final result; his interest is encouraged by his own immediate superiors, those "specialty foremen" already alluded to; and this enthusiasm, properly guided by the ship's officers, is what, in the end, is the secret of the success of that "curious combination," the naval organization on shipboard.

THE BLUEJACKET'S DAILY LIFE

An English writer not long ago described a battleship as the last word in aggressiveness pronounced by mechanical genius, naval construction, and cash payment. From keel to truck, from ram to sternpost, she is the most complicated machine the mind of man ever conceived. She is a citadel that must carry the heaviest guns for offensive power; a fort whose vital parts must be protected against injury by the thickest and best armor; a ship to be taken to sea and capable of making passages from port to port. She is, in fact, a fighting machine, so big and so shaped that every characteristic of her appearance conveys the impression of a heartless, monstrous engine of destruction.

All this is true. For the man-of-war is built for battle, and for battle only, and the sole aim of her designers has been to fit her for the rôle that she some day may be obliged to play. But once she has been launched, completed, and placed in commission, the interested visitor cannot fail to become sensible of the pulse-beat of a complex life that throbs through every frame of her gigantic hull. The ship that, in the making, had

been but a mass of vacant emplacements, empty gun-ports, and deserted compartments, now that the national colors are flying at the stern, no longer is "without a soul." She has become the home for a thousand men; not a place in which her crew spend the eight working hours of the day, but a place where they live the full twenty-four hours, year in and year out. The ship also must have all the facilities for clothing, feeding, and housing her men. And everything must be adequate—the laundry, the kitchens, the cold-storage rooms, the sleeping compartments, the bathtubs, the showerbaths, the fresh-water plant, the lighting plant, and all those things that go to make a home.

It is this personal side, this "human" touch, that appeals so strongly. The ship no longer is an inanimate object, but a real live being with a personality, and with peculiarities and characteristics as distinctive from those of her sisters as are those traits in as many different persons. Ask any sailor and you will hear tales that will make you wonder whether those yarns of green-eyed sea-serpents were so far-fetched after all.

To many people, certain phases of the life within a battleship's steel walls are not altogether unknown. They have heard that the officers dwell in the after part of the vessel and have separate rooms with berths in them, like the state-rooms

of an ocean liner; and they know that there are officers and enlisted men, marines and others. But there the information ends. How is the housekeeping for those thousand odd men conducted, who buys their food, and what do those men do with themselves all day long? No wonder the question comes to mind. The Navy Regulations clearly specify how all this is to be done, and when; but every civilian cannot be expected to have a copy of that document on his library shelf, and the daily press usually denies him all information about the navy that has the earmarks of being "usual" or "commonplace." Yet nothing is really more interesting than this "uneventful" daily life of the thousands of bluejackets who today man the fighting ships of our navy.

Officially, the day on shipboard begins at eight o'clock, when the national colors are hoisted, to the strains of the "Star Spangled Banner"; actually, the ship is astir hours earlier. The ship's cook has been roused before dawn, sometimes as early as three o'clock, so that the crew may have their bracer of steaming coffee before settling down to the early morning routine. At 5.30 a.m., the blare of bugles sounds the reveille, backed up by a chorus of boatswains' pipes and the warning admonition, "Up all hammocks! Rise and shine!" No extra naps are allowed.

"Scrub and Wash Clothes"

The decks must be cleared of hammocks in fifteen minutes. Then the "smoking-lamp," a cherished tradition of the old navy, is lit, all hands stuff their pipes for a hasty pull, and coffee and hardtack are served.

"Scrub and wash clothes!" From some mysterious *cache* appear buckets, soap, brush, and water. Every man is at it. And the bluejacket washes himself and scrubs his clothes as if this were his favorite pastime. Force of habit, you say to yourself. It is a lesson he learned at the Naval Training Station the very day he enlisted in the service—that neatness of person and dress is a requirement that the navy exacts from every man. And it is a good habit he never forgets.

At 6.30 all hands commence to clean ship. The crew is divided into divisions, to each of which is assigned a certain portion of the vessel to clean. The ship is running with water ankle deep; men everywhere are cleaning decks and paint-work, scrubbing boats, and, later, polishing brightwork. This duty is not arduous, as the stations are small and there are so many men on board among whom the work can be divided.

At 7.30 the bluejacket gets his breakfast—and he is thoroughly ready for it. Ham omelette, potatoes, bread, butter, and coffee is a sample bill-of-fare of this meal. The food is good, clean, and wholesome, well-cooked and neatly served.

All the cooking of the ship is done on one great range, in what is called the "galley." Here the ship's cook reigns supreme. He is paid from $28 to $61 a month, according to the size of the ship; and he gets perquisites from the messes. The men of the crew are divided into so many messes, according to the parts of the ship in which they swing their hammocks at night. Each mess has its own cook, and these work under the general supervision of the ship's cook, and heaven help them if their work is not well done!

With the cook rests the problem of preparing the meals for the men. But the responsibility of properly feeding the crew falls also upon another important personage, the paymaster. It is he who, as the representative of the government, purchases the supplies, with the regular allowance of "thirty cents per-man-per-day" granted by the statutes. The amount of each article of food allowed to each man for one day is specifically stated. These articles are all provided by contract. For instance, the paymaster gets the fresh beef from a certain man as "per contract No. 3201." The quantity of beef per meal is then decided by the number of men in the crew. The paymaster's yeoman measures out the precise amount allowed. This is served out to the ship's cook, and the storeroom locked up. The beef is then cooked, subjected to the knife of the

"Peeling Spuds"

carving machine, and when served to the men is found to have been cut into pieces so equal that each one has received the precise pound-and-a-quarter-a-day allowed him by the all-ruling Navy Regulations.

All this time, the smoking-lamp has been shedding its figurative rays, and the men have the next hour in which to get into the uniform of the day—which is designated by signal from the flagship every morning and depends upon the climate or the work to be done—to examine their ditty boxes and bags, wherein all their worldly goods are stowed, to visit the sick-bay if they feel in need of medical attendance, and to make everything shipshape for quarters at 9.30, when the division officers inspect their men for neatness of uniform and general condition.

From then until four o'clock in the afternoon, with the exception of an hour for dinner at noon, "when the sun crosses the yardarm," the greater part of the time is spent in drill—drill, that necessary evil, without which no perfection is possible. But there is an intelligent application of the means available in apportioning this all-important part of the ship's work, and it is a rare occurrence to find the crews doing the same thing any two days in succession. The big-gun drills, boat drills under oars or sails, general quarters, signal drills, fire quarters, collision

drills, infantry and field artillery exercises, clearing ship for action, collision and abandon-ship drills, searchlight drills—all have a place in the busy life of the man-o'-warsman, and are often interspersed with short practical talks by the division officers or by officers specially well-informed on the subject under discussion.

Of course it is hard work. The bluejacket often does not see why he has to go through the antics of setting-up exercises, or why he has to go "up and over,"[1] or why he has to run an obstacle race over the decks with the rest of his shipmates. He grumbles—every true sailor grumbles—but he soon comes to appreciate what it all means and why he does this and not that. Then he is satisfied. Discipline and efficiency always demand hard and exacting work both for the training of the crew and for the maintenance of the ship. The men never object to intelligent work itself, or to interesting and useful drills. Boating and swimming—prime "military" requisites of the sailor—are the delight of their existence; their enthusiasm for loading drills knows no bounds; their interest in steaming competitions is keyed up to the highest pitch; and even coaling ship is no bugbear when it comes to beating another ship's record.

Eight bells! Four o'clock, and the "knock off

[1] The exercise of climbing up and down the mainmast.

all work'' period has come. It is then the bluejacket smokes his pipe and takes his ease and sings his songs. The baseball, football, or track teams are getting ready to go ashore for their daily afternoon practice. The race-boat crew are manning their twelve-oared cutter preparatory to taking a ten-mile pull through the fleet and an occasional brush with a rival ship. Under the lee of the mainmast on the upper deck four sturdy bluejackets are pulling away at the fifty-pound pulley weights in the hope of getting enough practice to eventually win a place on ''the crew.''

A joyous bugle-call sounds throughout every compartment; it is ''Swimming Call.'' The men spring to their feet. Every afternoon and every morning, before breakfast, weather permitting, the men are allowed to go over the side and swim about, while a dinghy, manned by a ''life-saving crew,'' stands ready to assist any tired swimmer.

Below decks no one is idle. In a corner of the battery, the ship's tailor is bent over a diminutive sewing machine. Beside him, another bluejacket crawls on all fours over a strip of blue cloth that he is cutting out for his mate. Not far off, a youngster is engrossed in a magazine or book selected from the large and well-stocked ship's library with which the government furnishes every vessel of the navy. Still farther

off, the ship's barber and his assistants are hard at work, while a long line of white-clad men impatiently await the call of "Next, Sir!"

Wander up on the forecastle, and there take a glance at the "ship's playground," and you realize that the sailor's life is not altogether one of hard work. A group is squatted on the deck, playing checkers, cards, or backgammon. Another cluster of immaculately white-clad men are lying fast asleep under the shadow of the turret—they say no man has any business going to sea unless he can sleep at any time of the day or night. Up forward, a few of the many animal-lovers on board are playing with the mascots—a bear, or goat, or dog, or cat, or pig, or parrot, as the case may be. Few ships are without mascots. The sailor's natural fondness for pets is proverbial, and fortunate indeed is the animal that falls into his hands. As a well-known prelate[2] once said: "The sailor-man has his vagaries, but he is the tenderest-hearted creature into which God ever breathed the breath of life."

Mess-call for supper interrupts these good times at six. The tables and benches, which are hung under the deck-beams when not in use, are set up on deck, the table-ware—plates, cups, spoons, knives, and forks—laid out at each

[2] The Bishop of Shanghai; quoted in *The World's Work*, February, 1905, p. 3080.

place by the mess cook; and when the meal is announced, the enlisted man finds served some fresh meat pie or bologna sausages, potatoes, fresh fruits, bread, butter, and tea, or other equally appetizing dishes.

After supper, the sailor's time is his own; or, as he himself says, he is "allowed considerable leeway." What he now does is left to his own choice. Perhaps he dances on deck to the music of the ship's band—which, by the way, renders a number of selections three times a day, after each meal. Or he may see the "movies," since each ship has a moving-picture machine, and new runs of reels every week. Or he and his shipmates may give a smoker, or attend theatricals given by the crew of some other ship that evening.

Then, at nine o'clock, comes another bugle-call. It is "tattoo," which, in five minutes, is followed by "taps," after which every man must be in his hammock and quiet until the bugle again summons him to rise in the morning. But, as a rule, by that time the sailor is quite ready for bed and for his eight hours' sleep. He willingly swings his hammock—sailors never sleep in beds—and, after carefully folding his uniform and placing it under his pillow, where it will be neatly pressed for him when he awakes the next morning, climbs up into his folding-bed, which he finds more comfortable than any the summer

boarder ever rigged up on the front porch of a bungalow.

Such is the daily routine on board the men-o'-war of our navy, as set down in the traditional regulation books. Of course, it is subject to variations. For example, on Wednesday and Saturday afternoons the men's time is usually their own. Sundays, after muster and divine service, the bluejacket is subject to no further restrictions. But on the other hand, the periods of drill as outlined are often changed by reason of the duty upon which the ship is engaged, or because of the severe weather of the North, or of the heat of the tropics. It is an ill rule that allows for no exceptions, and the navy, fortunately for the interest and fascination of its work, has learned this saying and learned it well.[3]

[3] See Appendix IV.

Airing Bedding on the Forecastle

THE BATTLESHIP AS AN EDUCATIONAL INSTITUTION

It has always been a question for debate in this country whether the Stars and Stripes should be represented by a large and efficient navy, or whether a few units would not answer our purpose and meet the exigencies of the present moment. The politicians have argued the question; the citizens themselves have thrashed it out; and even the peace enthusiasts have interpreted it to their own satisfaction. But none appears to have viewed the matter from an unbiased point of view. The navy has always seemed a mere collection of fighting machines—dogs of war awaiting the command to rush forth to combat—a folly, a wanton extravagance. Yet today, when a large part of the offensive object of the navy may seem unnecessary because of the closer and more intimate relations of nations and the higher development of mankind, the Service has proved its adaptability to fit into the new order of things and has become a large national university for the training of citizens for our republic.[1]

[1] This industrial education of the enlisted personnel is, however, only incidental to the maintenance of the navy as an efficient

Those who believe in unlimited arbitration and universal peace and disarmament apparently have entirely overlooked this unique feature of our sea force. A single reading of the requirements of citizenship would reveal to them how perfectly the Service trains young men for their duty to their country. For the navy is an educator. While preparing the ships and their crews for the national defense, it gives its fifty thousand enlisted men a thorough practical training in the useful trades of peace. The battleship is not merely a fighting machine, but it is in every sense a complete and splendidly equipped manual training school, where men are engaged in a score of different occupations specially fitting them for careers in civil life. Electricians, bakers, boilermakers, cooks, coppersmiths, carpenters, pharmacists, machinists, plumbers, sailmakers, stenographers, painters, wireless telegraphers, bookkeepers, are all educated and trained. And in doing all this, the navy is, in the essentials, carrying out a policy of industrial education such as the Commonwealth of Massachusetts not long ago adopted after careful and

instrument of national defense. The navy, it is well to remember, is an institution for war, and for war only. Its primary purpose can never be "Education" in the sense advocated by the present Secretary of the Navy, and unless the new primary school movement is carefully safeguarded, the officers of our ships of war will soon be devoting their energies to the education of their men for civil pursuits rather than for war service.

authoritative investigation. It is practical education designed to fit the youth to take care of himself in the world. It is the kind that will bring out all that is good, that will develop him, and make of him a man. It develops "naval efficiency," the qualities constituting which the *London Times,* in a leading article in 1899, enumerated as "self-reliance and resource, calmness and self-possession in emergency, quickness of eye and steadiness of nerve, steadfastness in danger, self-helpfulness in difficulties, and a quick sense of comradeship,"—a summary that has been neither denied nor amplified.

"The true meaning of the term 'education' is often lost sight of," writes Admiral Sir Cyprian Bridge, R. N.[2] "It is not a mere scheme of imparting school-room instruction. It is a system of bringing up the youth of a nation, and not with the aid of books alone, for the part that it will have to play in the national life." This rôle the navy pre-eminently plays. It teaches patriotism, and reverence for the flag and for everything the flag stands for. It instills in the youth a respect for duly constituted authority—a trait sadly lacking in the American character of today. It teaches the young citizen how to live healthfully and how to take care of his body properly. It gives him a broader view of life by training

[2] In his *Art of Naval Warfare,* p. 75.

him in a career in which he will be capable of manual self-support; and by teaching him something about other nations, it makes him appreciate what his country is, and what its place should be among the powers of the world. And it drills in these essentials through instructors who are not theorists but practical masters of their subjects, and the leaders physically, mentally, and professionally, of the men placed under their charge.

The personnel of the navy may, therefore, be said to consist of two separate and distinct classes; the officers, who follow a profession, and the enlisted men, who follow a trade. The one is the instructor; the other the pupil, to whom, by the way, no opportunity is ever denied of also eventually attaining commissioned rank.

To qualify for the naval profession, young men already well grounded in English studies attend the technical college at Annapolis, Md., known as the United States Naval Academy. Here, during four years, they pass through an academic course that gives them the preliminary training necessary to fit them for their chosen life-profession. On graduation they join their first ship, and with this, their first commission, begins an active career in which the details of handling ships, men, and guns are learned in the only school for sea-officers—the ship.

With the enlisted men, however, the conditions are different. The young Americans who go into the navy must be between the ages of seventeen and thirty-five years, and be of a normal height and weight; they must be American citizens, native or naturalized, and must, in addition, furnish satisfactory evidence of good moral character. The term of enlistment is for four years, exactly as long as the undergraduate course of our universities and colleges, but there are no vacations other than the usual three ten-day periods allowed annually by the Regulations. Once enlisted, the recruit, now known as "an apprentice seaman," is sent to one of the several excellent training stations which the service maintains to ground the men in the various duties required of them before launching them upon the broader and more complex life of the man-o'-war. These stations are located at Newport, R. I.; Norfolk, Va.; North Chicago, Ill., and San Francisco, Cal., and here for four months the recruits are instructed in the rudiments of their "trade."

Immediately upon reporting at the indicated station the apprentice receives from the Government an outfit of clothing, which is given him outright as capital with which to start his new life—uniforms for winter and summer, shoes, underwear, cap, sweater, overcoat, oilskins, and

rubber boots—in all amounting to sixty dollars in value. These are fitted by a tailor. Then he is ready for instruction.

Under the immediate supervision of a petty officer the recruit forms part of the "newcomers' squad," in which he is taught the necessity of discipline, regular habits, and cleanliness of person. His first lesson is in how to keep his own things shipshape, how to keep his uniform neat, how to stow his bag, how to sling his hammock and lash it handily, and how to swim. All this takes place in well-heated and well-ventilated barracks.

Then the apprentice seaman is assigned to a company or division, and he begins to master the various drills and exercises. He learns how to "box the compass" from the huge painted reproduction on the wall of the drill-hall; he acquires a knowledge of signalling and soon becomes familiar with the flags of all nations; he becomes proficient in heaving the lead and in the use of the log, gradually mastering the difficulties of the "marks" and "deeps." The model room and rigging loft afford him plenty of opportunities for making knots and hitches, splicing ropes, and coiling down gear, until he has acquired the ability of making himself a handy man about the decks.

This brief experience fits him to take his place

Setting-Up Exercises

on board one of the small practice vessels attached to the station, and during his first cruise he puts into use afloat what he has already learned on shore. The life on shipboard becomes perfectly familiar to him, he acquires his "sea legs," and by the time these cruises are over, he comes to know about hoisting boats, getting under way, anchoring, steering—an application of his early training which he could not get in any other way.

The four months ended, the apprentice seaman is ready for advancement. An examination is given him in all that he has thus far learned, and if he qualifies, he gets a rating and goes on board a man-o'-war, with an increase of pay and with the knowledge that his certain and steady promotion in the future depends solely upon his own energy, zeal, and good behavior.

The seaman has now been partly trained. But his sphere of action, as he well knows, is necessarily limited, because he knows only the rudiments. This is well appreciated. For in every ship's company a certain proportion of the seaman class, the deck force, are not specialists in any of the many trades represented on board, and the problem that now arises is their further training in order to make them efficient men-o'-war's men in the modern sense of the word. Formerly, in the "good old days," when the crews of our war-

ships were recruited almost exclusively from the seafaring population of the coast towns, it was not essential that the men have any other qualifications than a mere knowledge of how to "reef, hand, and steer." But today the need is for an entirely different class of men. The duties of the enlisted man are complex, the modern sailor is more of a mechanic, and the majority of the men are drawn from the inland States rather than from the seaboard.

To meet these new conditions we now find schools in various sections of the United States where the men may be trained as specialists in the different duties so necessary on board the modern Dreadnought. Two large Electrical Schools are maintained at New York and Mare Island, Cal., for those who desire to receive the benefit of that course of instruction. Here the candidates are given a thorough training in all that has to do with the electrical work on shipboard. For on the battleship of today nearly everything mechanical is done by electricity. The anchors are hoisted by electric winches, the ship is steered by an electric device, electric ranges in the galleys are used to cook the crew's meals, a great dynamo-room furnishes the light for all of the thousand inhabitants on board, and some vessels are even propelled by electric power alone. The electrician's work is,

therefore, a most important one, and he has to become a past-master of his trade. And in addition, modern conditions have imposed upon him the added responsibility of the wireless, which has become so essential a part of a ship's equipment. Three hundred young men are usually in attendance at the Radio Service Schools, where they devote five months to acquiring the principle and theory of that interesting application of science. They here learn to build the powerful wireless apparatus from absolutely "raw" materials; they are taught the assembling of motors and dynamos; they become familiar with every detail of construction and operation. This accomplished, the radio operator goes to sea with the active fleet, and after a year as assistant operator he obtains his reward in a permanent berth.

Next, and equal in importance, to the Electrical Schools are the Seaman-Gunners' Classes, which are open to bluejackets who have served four years and have clearly shown their ability. This school has two homes, one at the Washington Navy Yard and the other at the Newport Naval Torpedo Station. The class in Washington meets in February and August, and the course continues for six months, when the men are qualified (as gunners' mates) in all that pertains to the battery of the man-o'-war. The work is equally

divided between the classroom and the Naval Gun Factory. The men learn how to assemble guns, breech mechanisms, and everything that has to do with the practical part of ordnance, the manufacture of shells, and the various firing and aiming devices. Work on the big guns starts on the huge 100-ton cylinders of steel, which are trimmed and forged, drilled and grooved, and finally expanded by heat to receive the tempered steel lining. Then the gunnery aspirants enter the forge shop, and from there pass through the various departments until their instruction closes with a fortnight at the Naval Proving Grounds at Indian Head, Md. After this the Naval Torpedo School at Newport supplements the learning already acquired with an eight months' course in the manufacture and use of high explosives, the care of torpedoes, and the construction and laying of submarine mines.

What else must be known by those on board the modern ship-of-war is revealed by a glance at the other schools located at Charleston, San Francisco, Norfolk, and Newport. At Charleston, the school for machinists furnishes an opportunity for those interested in mechanics to study engines and marine boilers and thus acquire a theoretical and practical education to prepare themselves for petty officers and warrant officers in the artificer branch—engine-room force—of

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the navy. At Norfolk, carpenters, plumbers, blacksmiths, coppersmiths, painters, and cooks are turned out by the score. There are Yeoman Schools for the instruction of men in the clerical duties of the navy, the Musicians' School for the training of members of the ships' bands, and the Naval Hospitals at the various yards where the hospital apprentices are taught the practical side of ward work, pharmacy, and chemistry.

This completes the curriculum of our great national university. Its traditions are an inspiration few other educational institutions can boast of, and its motto—"Fidelity, Obedience, and Ability"—briefly describes a type of character that has ever been a source of pride to the Service.

Every year thousands of bluejackets who have had at least four years' training in the navy return to civil life. None fail to secure immediate good employment, for American employers have learned through experience that the graduates from the Fleet are, without exception, so well grounded in their work, so resourceful, and so far above the average in their ability and willingness to make suggestions, and at the same time to obey quickly, without sullenness or resentment, that they have generally welcomed men who have been trained afloat under such conditions as have existed in recent years.

The policy of the Navy Department to better the condition of the enlisted man on board ship and increase his opportunities has done much in recent years to attract to the navy a class of young men of whom the country may well be proud. No patriotic citizen can visit one of our great Dreadnoughts and escape a feeling of admiration when he sees the clean-cut, intelligent bluejackets who are giving their services to their country. Each one of them is an exponent of healthful life, good habits, and the discipline of the Service. How high is that standard of character is not generally appreciated, and cannot be, unless one realizes that out of 75,457 applicants for enlistment in the navy during the past year (1913) only 17,918 were accepted! Membership in the navy is indeed an honor from which the undeserving should be and are excluded!

THE ENGINEERING COMPETITIONS

"All well and ready for anything." This was the message received by the Navy Department in the spring of 1911 from the battleship *Delaware,* upon the latter's return from her 26,000-mile voyage to Europe and South America. Thirteen years before the *Oregon* thrilled the nation by her wonderful cruise at the outbreak of the Spanish-American War. But, though the *Delaware's* voyage was not made under such circumstances as that of the *Oregon,* her remarkable performance and the conditions attending her work aroused the same sort of pride in the achievement of the ship and of her men that greeted the latter's record-making and record-breaking trip. The *Oregon* had found a worthy successor in the *Delaware.*

Figures, to some people, mean very little. But these spell the history of days, months, and years of watchfulness and care. The modern Dreadnought is truly one great fighting machine, in which the man behind the gun may reign supreme; yet below her protective deck, in the engine-rooms and fire-rooms, are skillful toilers whose share also contributes to the full measure

of duty towards making her the efficient weapon she eventually is. See the ships steaming along in perfect line, each vessel just so far from the flagship, as though they were being drawn by a single cable. These floating fortresses are each weights of twenty thousand tons, yet they swing along with greater ease than a child's toy train and manœuvre with the precision of parading infantry. Would this be possible without the man at the furnace and his partner in the engine-room?

The first thing that strikes the visitor upon going over a modern ship-of-war is, without question, her tremendous complication of machinery. She is a web of steam pipes, hydraulic tubes, compressed air conductors, electric wires, telephones, voice tubes, and engines of every sort to the number of almost a hundred. Down at the bottom of the perpendicular iron ladders, sheltered by the armored bars of the protective deck, is the great, clean, almost silent engine-room.[1] The reek of hot oil rises in noxious whiffs from the swift-running turbine, its drums showing no movement without, but within whirring the "rotor" at enormous speed. Over this "little world," attended to by almost one-third of the ship's company, rules the Chief Engineer with

[1] One would, however, hardly recognize the massive, laboring, reciprocating engine in this description.

Coaling Ship

his assistants, and under their guidance toil the various grades of artificers who drive not only the turbine engines which propel the ship at over twenty miles an hour, but the scores of minor clattering intricate machines that supply the electric current, keep cool the magazines, work the steering gear, turn winches and capstans, ventilate the ship, supply fresh water, and perform a dozen other necessary jobs, while about the decks are scattered the various repair-shops—the copper shop, the machine-tool shop, the blacksmith shop, the foundry, the pattern shop, and the boilermaker's shop. What other structure today contains such a complexity of mobile power, so great a variety of mechanism![2]

[2] But while the mass of the machinery is impressive, few of the people who make even cursory inspections of a man-o'-war's engine-rooms have any idea of the details to be mastered, and the work accomplished, in maintaining the tremendous power-plant installed on a modern Dreadnought. They have no conception of the devotion to duty which is necessary on the part of each individual working in his own sometimes obscure, uncomfortable, and frequently dangerous corner, with the full knowledge that he must do his part to the end, out of the sight of man, and without the recognition which those who work in the daylight above him may receive. The toll of death due to casualties in engine- and fire-rooms far exceeds that in the turrets and magazines, yet there has been no shrinking, and no holding back. There is no class of men on board a ship with a higher sense of duty, better discipline or traditions, or who are more apt to acquit themselves with credit in time of stress than the members of the engineer's division. Their duties are of equal, if not greater, importance than those of their shipmates who fight the guns. It is as necessary for a ship when called upon for battle to reach and to maintain a station favorable for the fighting as

The modern marine engine is certainly something to wonder at. So perfectly has it been developed, that today it may be said to have acquired almost human intelligence. Formerly machinery seldom did what was expected of it; steam was wasted and not utilized to its full extent; "economy" never was possible. But in these days the three- and four-cylinder reciprocating engines are capable of utilizing the pressure of steam to the utmost. So greatly has the expanding power of steam been developed, that, after being generated in the compact water-tube boilers, it is capable of driving not only the piston of the small high-pressure cylinder, but those of the intermediate and low-pressure cylinders as well, before being taken back into the condenser to be turned into water again.

The days of the reciprocating engine, however, seemed numbered when, in 1894, the marine turbine was first installed on shipboard. No one can forget the tremendous sensation created at the British naval review of 1897, when the *Turbinia* dashed about at a speed of nearly thirty-four miles an hour. No such performance had

it is for accuracy and skill in gunnery after this station has been reached. The men below cannot hope to see, or to know, what is taking place in the outer world in the final and supreme test for which a battleship is constructed. Without the morale and the training which will insure a proper performance on the part of the, at times, termed "black gang," success on the day of battle will become impossible.

ever been possible with the old, throbbing, piston-worked engine. The British Admiralty immediately appreciated the possibilities of the Parsons invention, and the British Navy before long became the proud possessor of two torpedo-boat destroyers having a speed of thirty-six knots, which, not many months later, were followed by others capable of maintaining even greater speed.

In its most elementary form, the turbine is an astonishingly simple contrivance. It consists of a cylinder, on the inside of which are fixed series of blades, called guide blades. On the shaft, which runs through the cylinder, is fixed another series of blades, called rotor blades, projecting into the spaces between the fixed blades. When steam is admitted into the cylinder, it finds itself retarded by a ring of fixed blades, which throw it against the moving blades attached to the shaft. The high pressure exerted by the steam against these starts them revolving, and this in turn causes the steam to be deflected on to the next series of fixed blades, and so on till it finally makes its escape through the big exhaust pipe.

In the face of the almost universal adoption of the turbine for warship-propelling machinery by the nations of the world, it may seem strange that the United States should have preferred the "old" reciprocating engine for its larger cruising

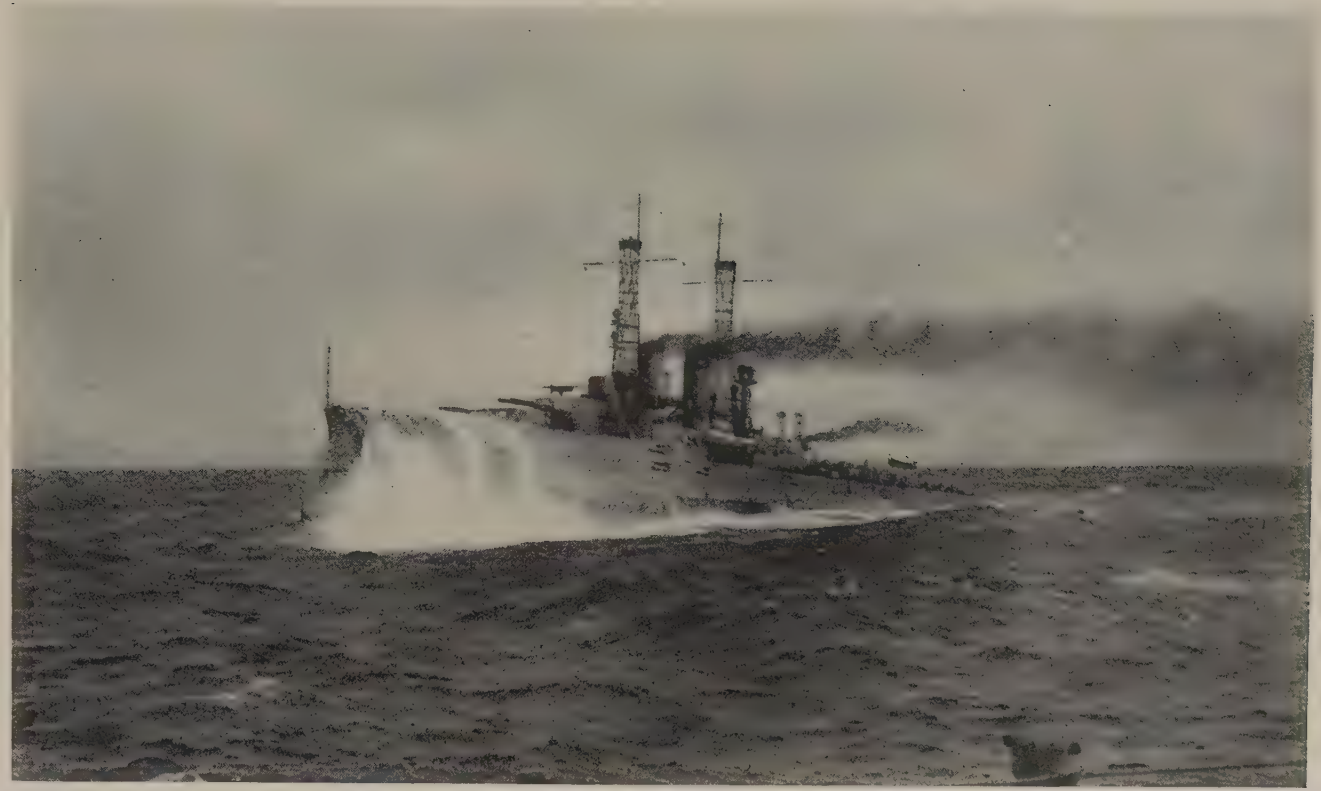
vessels. But this decision was not arrived at hastily, or without due investigation. For over a year the comparative merits of the two types of machinery were the sole topic of discussion. But no final judgment was possible without actual trial under all service conditions. So the Bureau of Steam Engineering determined to put the burden of proof upon the engines themselves, and the result was the exhaustive tests of the new Parsons and Curtis turbines as well as of the old reciprocating type of machinery that followed in the scout cruisers, *Birmingham, Chester,* and *Salem,* and in the battleships, *Delaware* and *North Dakota.* That year saw the eyes of the engineering world centered upon the American Navy. Every possible demand was made upon the machinery of each of these vessels, and in the case of the *Delaware* the reciprocating engine was subjected to an even greater test of reliability by a surprise full-power run of twenty-four hours immediately following her return from her extended South American cruise, when she had been in port but twenty-two and a half hours for the purpose of refilling her bunkers. With the varied experience of all those disinterested and most exhaustive investigations, the Navy Department had data, not available to any foreign government, upon which to base its final decision.

The turbine, without question, possessed many advantages over the old type of machinery. It rendered possible a higher speed of propulsion, and, by the absence of reciprocating parts, did away with practically all vibration. For the smaller high-speed vessels, such as torpedo-boats and destroyers, the turbine proved a godsend, because it not only greatly extended the speed at which they could be continuously driven, but, in addition, increased the safety with which this might be done. In the case of the larger ships, however, the turbine fell greatly below expectations. At cruising speed, the old reciprocating engine was about thirty per cent more economical than the turbine, while at high speed their performances were about equal. But the turbine's one great disadvantage lay in the fact that it would not reverse, so that, to run the propellers backwards, for backing the ships, additional turbines in an opposite direction would have had to be installed.

Whether these experiments would have aroused so general an interest before the days of the present engineering competitions can only be conjectured. Previous to the year 1906, the upkeep of machinery, while receiving considerable attention, had not yet felt the influence of the systematic methods of operation that now are the rule. The organization of the engineering departments

on board our vessels-of-war was good, and all known contingencies were well provided against. But there did not exist the desire on the part of the engine-room personnel to run the ships at full power in order to demonstrate that all the details required for a successful outcome had been carefully attended to. And such a desire was not encouraged, for the importance of engineering as affecting battle efficiency was either not understood or neglected. Certain engineer officers did pay the strictest attention to the prevention of waste of fuel and oil, kept the joints tight, and the engines carefully aligned. But these efforts were individual; there was no encouragement, no incentive other than pride.

Then came the moment when gunnery received its powerful impetus. So astounding were the results in the handling and firing of the ships' guns, that the application of similar methods to engineering became the topic of discussion. Why would there not be a saving in coal and oil if the same sort of attention was paid to firing the boilers as was now paid to the loading and pointing of guns? Unofficial ships' competitions in some cases contributed to save coal and raise the standard of efficiency of the individual units, a step in the right direction which showed what might be accomplished, but it was still individual effort.



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THE U. S. S. UTAH IN A SEAWAY

The suggestion for the establishment of tests and trials and the placing of the engineering personnel on a competitive basis was duly made to the Navy Department under date, August 22, 1906. No better moment could have been selected for the filing of this recommendation, for a squadron of armored cruisers, sister-ships, were under orders to make a voyage to the Asiatic Station, via the Suez Canal, a passage of 13,000 miles. A splendid opportunity was at hand for really studying the problem of the care and management of machinery, and giving proper attention to the many matters, such as gas analysis, coal analysis, proper cut-off, tightness of main engine valves and piston, use of half-burned ashes, etc., that up to that time had not been sufficiently considered. But the matter was overlooked, and the scheme never put into effect.

When, in December, 1907, the Atlantic Fleet started on its voyage around South America, there were plenty of skeptics who prophesied that it would never reach the coast of California intact. Never before in its history had the navy been called upon to perform such an engineering feat. Never before had the ships comprising the fleet cruised such distances in company or in fleet formation. The long runs, the repairs that would necessarily have to be made on shipboard, and the necessary coal economy that would have to

be practiced, made it look as if the chances were all against the entire sixteen battleships arriving at the same time. The voyage was to be the greatest test ever imposed upon the fleet of any nation.

By January, 1908, the ships had reached the coast of South America without mishap, but with the knowledge from experience of how much would be gained from a systematic consideration of the problem of cruising efficiency. Rear Admiral Evans, therefore, signalized the success that had crowned the efforts of the fleet's engineer-force thus far, by issuing a general order instituting an engineering competition for the battleships and a separate one for the destroyers. For, since the efficiency of any vessel in battle is based not only upon the performance of her battery, but also, to a very large extent, upon that of her engines and their appurtenances, every effort should be made to develop maximum speed under both forced draft and natural draft, with economy of coal and oil, as well as to economize under ordinary cruising conditions. Breakdowns in formation were to be penalized, while in the case of the destroyers, torching at night, while running at high speed, was forbidden. The competition ended at Magdalena Bay. The distance covered was 8,210.5 miles, but the interest and zeal of the personnel, both officers and men,

in trying to increase the efficiency of the fleet in "economy" had been such that a total saving of 1,460 tons of coal had been realized.

On June 28, 1908, at San Francisco, the competition was resumed. The factors remained the same, but an additional clause was inserted in the rules encouraging economy in lubricating oil. In the Sea of Japan unusually heavy weather was encountered, and the vessels' bottoms were fouling rapidly, yet on the long run from Honolulu to Auckland the saving of fuel was so marked that the commander-in-chief cabled to the Navy Department in Washington to reduce the estimates for the amount of coal necessary at Colombo and Negro Bay from forty-seven to thirty-nine thousand tons, those "revised estimates rendered necessary by decreasing consumption shown since leaving San Francisco."

What would have been the outcome of the voyage around the world had there been no competition cannot be conjectured. It was freely predicted, before the fleet sailed from Hampton Roads, that a trail of broken-down battleships would mark the course from Old Point Comfort to the Golden Gate. No such humiliating spectacle, however, fulfilled the prophecies of the volunteer soothsayers. Not only was the cruise to San Francisco successfully completed, but the voyage was continued around the globe, so that

by the time the fleet returned to Hampton Roads it had actually made three times the mileage that was involved in the passage around the southern continent, and it had, besides, adhered, almost without a break, to a schedule of dates of departure and arrival.

Instructive as the results of the competitions were, the saving of fuel and oil was as nothing compared with the experience gained in developing the resources of the ships themselves. The very character of the voyage tended to force them to be self-supporting, to maintain in every degree their efficiency. Minor repairs were quickly made, and everything kept "shipshape." The voyage around South America passed uneventfully, except for the enthusiastic receptions received at every port. Then followed the passage across the Pacific Ocean, and the visits to the Philippines, Japan, Australia, and Colombo, after which there would be no port of call until Suez was reached. At this very moment the unexpected happened. The starboard main high-pressure cylinder of the *Kansas* was found to be in bad condition. Repairs were imperative, but the ship was scheduled to leave Colombo in three days. The fleet had remained intact for one year, every run had been made on schedule time, and any failure in this fine record now would have been a keen disappointment to the

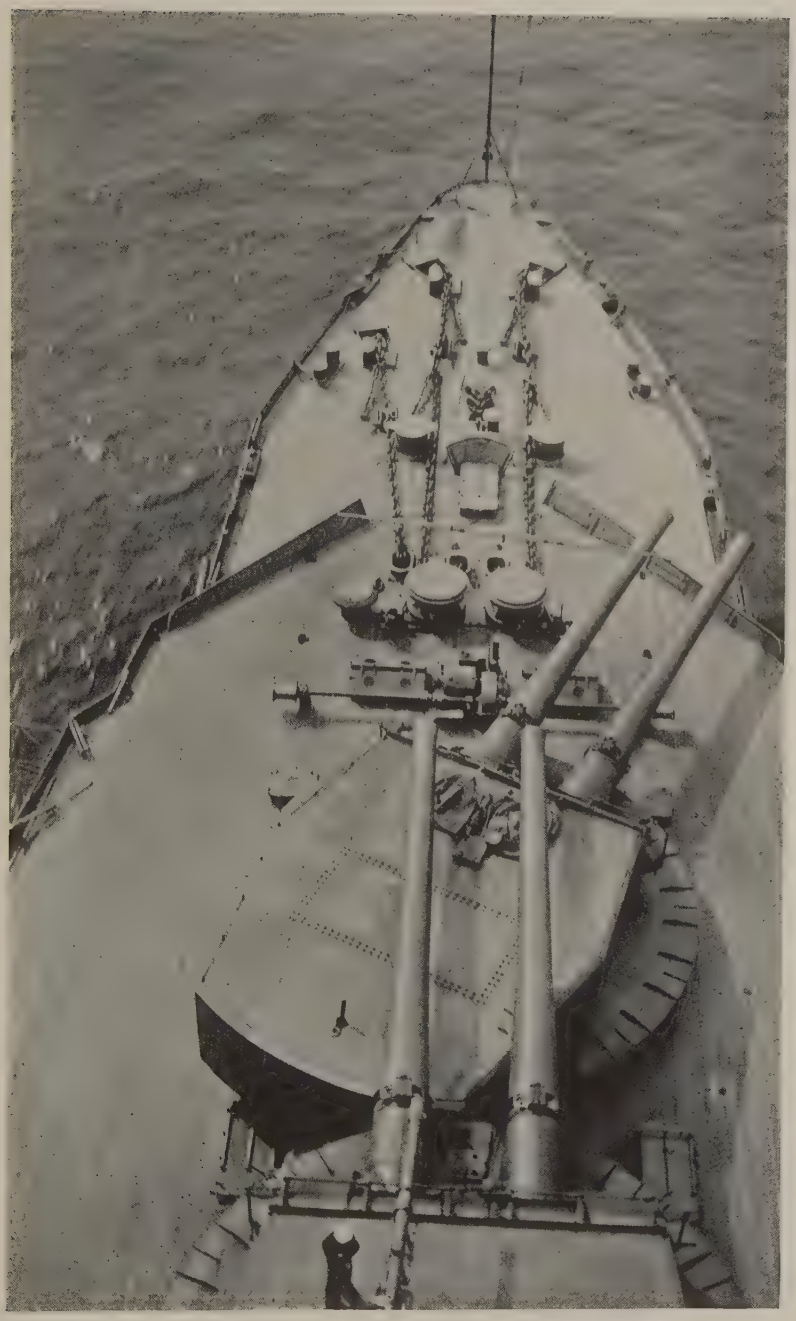
country as well as to every officer and man. While a new cylinder could not be made, it was possible, with the facilities on board, to rebore the old one. This is what actually was done on board the battleship during the passage from Colombo to Suez. The starboard engine was compounded, the *Kansas* left with the other ships on schedule time, and never once failed to maintain her position in the fleet, which continued the voyage at standard cruising speed as if nothing had happened.

The experiment had been even more successful than its advocates had anticipated. From that date the Engineering Competitions were officially established by the Navy Department. The drawing up of rules, the computing of standings, and the publishing of results were entrusted to the Director of Target-Practice. The two great factors of battle efficiency, gunnery and engineering, had at last become identified with each other.

Every year a regular schedule of engineering work is mapped out for each vessel in the fleet. No matter where the ships may be, that work has to be done, and upon the way in which it is done depends their final figure of merit in the year's competition. The necessity of holding steaming trials so frequently cannot be understood by the non-navy man. His sole experience is with

merchant craft, "liners," and tramps, which, once clear of the land, open wide the throttle, strike their pace, and then hold it to the end of the voyage. But with their sister, the ship-of-war, the requirements are entirely different. Her cruising is seldom done alone. Most of the time she forms part of a squadron or fleet, and this means that she has her designated place in the column. To the merchant skipper it may not mean much whether his ship moves through the water a little faster than her sister-liner, or whether both her propellers do the same amount of work. But to the battleship in the line of battle it means whether she keeps her ram within 250 yards of the stern of the ship next ahead and whether she is maintaining the rate of speed signalled by the flagship for that moment. Then is the time that the results of her latest standardization trials need to be known.

In one other particular also has the battleship's engineering force a more onerous duty. The merchant vessel never varies the speed at which she hastens across the seas. With her it is full speed from port to port. But the ship-of-war is allowed no such indulgence. She has always to be ready to obey the will of the admiral on the flagship, and at his bidding change her gait, and at a moment's notice make a spurt or drop several knots, as the occasion demands. What merchant



The Battleship Wyoming's Forward Turrets

vessel now on the high seas could weather such a test?

The battleships and armored cruisers, destroyers, and submarines now compete annually for the handsome trophies awarded by the Navy Department for superiority in the different classes. The deserving members of the engineer's force of the trophy-winning ship wear, throughout the year, a red "E" on the sleeve, and the ship herself is distinguished by a red block letter "E" painted on her after smoke pipe. In addition, the vessel having the highest combined final merit for both gunnery and engineering is awarded the battle efficiency pennant, the greatest distinction that any vessel can receive.

For the year 1909-1910, the *Nebraska* was declared the winner in the battleship class, and the *Preble* the leader of the destroyers. The year following, the armored cruiser *North Carolina* had the privilege of wearing the "E" on her after smoke pipe, while the *Preble* again led her swift-steaming consorts. In that period, a new phase in the competitions was instituted by the inclusion of the submarines among the classes eligible for awards, and the result was an unheard-of amount of surface, submerged, and awash work. That year the *Moccasin* won the trophy of this novel and interesting competition, while in 1911-1912 the *D-3* carried off the highest

honors. For 1911-1912 in the battleship class the armored cruiser *Maryland* earned the right of carrying the trophy, and, finally, for the year just completed, 1912-1913, the following stood at the head of their respective classes: the battleship *Utah,* the destroyer *Burrows,* and the submarine *D-3.* To the commanding officer of each of these vessels the Secretary of the Navy addressed a congratulatory letter, while to the battle efficiency winner, the *Idaho,* in 1912-1913, went a commendatory letter from the President of the United States, a copy of which was placed on the record not only of her captain, but of such of her officers as were directly responsible for making her, "with the material at her disposal, the most efficient battleship in guarding the country's interests."

It is the belief of naval officers that, in management and operation, the navy is at present in a very efficient condition, and the best sign of this healthy condition is that it is still making progress. The great increase in efficiency that followed so quickly upon the introduction of scientific methods of management has since been followed by such further and continued improvement, that a most encouraging condition has now been reached. The Navy Department's appreciation of the part that engineering plays in naval efficiency was a step in the right direction.

Photo by O. W. Waterman

A Destroyer Division in Cruising Formation

Encouragement and recognition of individual effort were what were then most needed, and, with these as incentives, so interested an attention to duty has since that moment been secured, that more miles are today steamed for a given expenditure of coal, oil, and supplies, than at any former time; ship-repair bills are showing a steady decrease; the ships are better handled each succeeding period; the vessels are kept in repair and spend less time at the navy yards than they formerly did, and are able to develop higher sustained speeds than ever before; and the personnel in the fleet, both officers and men, is today pulling together to secure not only efficiency but also economy.

ATHLETICS IN THE NAVY

"In all occupations that require an expenditure of physical effort, bodily vigor is of particular importance. It is with this object in view, that officers (and men) should be encouraged to engage in athletic sports which preserve the vigor of the body. Other countries (except France) are not satisfied with merely favoring athletics; they almost impose them through the opportunities they give to practice them and by their systems of education. Though athletic sports cannot be a substitute for war, they nevertheless develop certain qualities essential in its conduct. In every game, there is competition; there is a victor and a vanquished. To carry off the honors, the mind as well as the body must be made to work. As in war, one is continually striving for superiority by a gradual increase in the expenditure of energy. It is easy to speak of courage, decision, and initiative. But these qualities are not found in the shop: they grow like mushrooms in suitable soil. Action is what develops them."[1]

Such is the problem that today confronts the

[1] Daveluy: *L'Esprit de la Guerre Navale,* Vol. 3, p. 16.

naval administrator and the naval officer. In the age of the sailing frigate, the day of the "heave and haul," there was little difficulty in keeping the crews in condition through exercise. No captain bothered his head about so trifling a matter. There was no need of it. Smartness aloft was the one essential aboard a man-o'-war, the one thing upon which depended the honor of the ship. Yet this very "smartness" in making and taking in sail, and in crossing and sending down yards, about which the frigate captain cared so much, unconsciously furnished the exercise so necessary to the well-being of his men. In fact, he often exacted a greater expenditure of physical effort than they well could furnish. The topmen had to be smart, and more than smart. They had to fly up aloft at the order, lay out on the yard, reef or furl, lay in, and be down on deck again, before the boatswain's mate could draw his "colt." It was "mast against mast," with the men actually running aloft and along the yards in their efforts to be first.

But today there is no such thing as making or taking in sail. The topman no longer exists on shipboard. Instead we have the mechanic, the gun-captain, the artificer, the engineer, all of whom work entirely below decks. The engine-room, the machine shop, the steel-walled turret, the gun-mount, and breech mechanism are where

their energies are centered. But what exercise do they get from their occupations on board ship now? Physique and morale suffer from the want of real physical effort. It is to counteract this unfortunate condition of modern shipboard life that artificial means have been resorted to. Setting up exercises, in a way, fulfill their purpose of causing "every man on board ship really to exert all his muscles daily" and of providing "exercise." But alone, they have never sufficed to keep the men in the best possible physical condition. Something additional is needed; something with a mental as well as physical effect. There is but one answer to the question: athletics.

This discovery, however, cannot be claimed for the steam navy of the present. It was made long ago, in the days of the sailing line-of-battleships, when sports, as now, were essential to the tars' contentment on shipboard. No two ships could be in company without some question of superiority arising, and few were the officers who denied their crews the excitement of a boat race or boxing bout. But, until recently, there was no encouragement given to athletics. Whatever was accomplished was due to the enthusiasm of the few individuals who appreciated its importance. There was no systematic effort to extend the bearing of sports upon the physique and morale of the entire crew. Only in 1900 was official

cognizance taken of the matter by the Navy Department in Washington. Up to that time the Navy Regulations had merely instructed the captains of the ships-of-war to "use all proper means to preserve the health" of their crews. But in that year an additional clause was inserted, whereby the commanding officers were specifically urged to "encourage the men to engage in athletics, fencing, boxing, boating, and other similar sports and exercises."

The part that our naval station at Guantanamo Bay has played in the successful organization of athletics in the navy has been most important. The advantages of the place led the service to an unconscious solution of the great problem. No more ideal stretch for boat racing could have been selected than the beautiful waters of the outer bay; the extensive sun-baked tidal-plain behind Deer Point and on Hicacal Beach seemed destined by nature for baseball diamonds and running tracks; while the mild climate of the winter months could not have been better for outdoor work such as the navy men are always called upon to do. The matter was settled when Guantanamo Bay was selected as the base for the battle-fleet's winter work; it became the playground of the bluejacket athlete from January to April, those months when baseball, rowing, and all other outdoor sports, except football, are

discouraged, in more northern latitudes, by snow and ice.

Organized fleet competitions came into being from that moment.[2] Under the enthusiastic encouragement of Rear Admiral Robley D. Evans, then in command of the North Atlantic Fleet, athletic committees were formed on every ship under his orders. Intership sports were arranged and at every opportunity indulged in. The Department lent a helping hand by furnishing the larger vessels with standard navy racing cutters. Pulling races became the talk of the fleet. A beginning had been made. Organized athletics had come to stay.

"The purpose of athletics on board ship is to offer, to a large number of men, healthful exercise and amusement. The commanding officer shall encourage the men to engage in athletics, ... (and) when the weather and other circumstances permit, he shall establish in the routine of exercises and drills a regular period for swimming, such exercise to include every enlisted person on board, except those excused by the surgeon. Whenever circumstances permit, athletic parties shall accompany teams engaged in match games. . . . . It is desirable that interest

[2] Guantanamo Bay was formally taken possession of on December 10, 1903, but the Atlantic Fleet's first use of it as a base for manœuvres was not until 1905 and 1906.

An Impromptu Boxing Bout

be sustained for the manly sports themselves and the just pride attaching to success in contests, and that the vicious element of betting be restricted." With these words, the commander-in-chief of the United States Atlantic Fleet, in a fleet order issued July 1, 1913, introduced the new edition of the rules governing the athletic competitions of the officers and enlisted men under his command. Every possible sport has its trophies. There are boat-pulling races for launches, cutters, whale-boats, and dinghies; sailing races, "free for all," as well as for each class of boat; boxing and wrestling contests for all weights; field and track meets; baseball championships; football games; fencing matches; basket ball championships; swimming races and water sports; rifle team matches; and signal competitions—surely a variety sufficient to satisfy the tastes of every one of the twenty thousand uniformed candidates and spectators.

That every attention might be given to the proper administration of these sports, a Fleet Athletic Board was established in 1908 to advise the commander-in-chief upon all matters pertaining to athletics in the fleet, such as changes in rules, methods of determining contests, trophies, and finances. The four battleship divisions, the torpedo flotilla, and the fleet auxiliaries are each represented in the membership of the board,

whose meetings are also attended by the captain of the flagship, an executive officer, and the Fleet Athletic Officer, who is a member of the Admiral's personal staff. Thus the interests of even the smallest vessel of that great assemblage of war craft are assured every consideration, and her chances of winning a championship are no less than those of her big sister, the battleship.

Every indulgence is allowed the men in these games, races, and contests, but only under these conditions—that there shall be no violation of the A. A. U. rules and no "umpire baiting" of any sort. In just one athletic league in this country has there ever been *real discipline*, and that is in the organization prompted and fostered by the United States Navy Department among the sailors of the country's ships-of-war, and that discipline is not arbitrary, but absolutely *military*. The umpires in all games are officers, who, in their Naval Academy days were heroes of the gridiron and diamond, and the slightest disrespect evinced towards them by any contestant is cause for summary arrest and transportation back aboard ship. The hot-headed ballplayer is not fined five dollars for talking back to an umpire, as in a professional league, and benched only for that game, but he is summarily led off the grounds and in addition incurs the military punishment for disrespect to an officer. The

result is that a spirit of true sportsmanship characterizes each and every competition. The men learn self-control and manliness in a school that has but one aim—true sportsmanship—with the result that there are few breaches of discipline, and very few disqualifications.

Where does the money to pay for all the outfits of these countless teams and crews come from? No wonder the spectator asks the question as he views the shores of Guantanamo Bay on a Saturday afternoon. Thirty-four teams are hotly contesting every "out" on the seventeen diamonds laid out on the target range and back of Hicacal Beach. Between three and four hundred baseball gloves are being worn, a hundred bats used, and countless balls "fouled." Who pays for all this "gear"? The twenty-five hundred bluejackets and two hundred and fifty officers in the grand stand around the championship field? No. No price of admission is ever charged to a naval athletic contest, nor are the men assessed the cost of the bats, balls, and gloves. A certain amount is annually appropriated by the Navy Department in Washington for defraying the expenses of "jack's" outdoor recreations, but this is never enough to satisfy the demands of the "fans," so the remainder is made up from the profits of the ship's canteens, which means that the men themselves pay for

their amusement by their purchase of sweets, writing paper, tobacco, and other luxuries from the "co-operative stores" on board.

Every winter about the month of March, when the grind of the preparation for spring target-practice begins to tell, a week of sports is decreed. Sports, sports, nothing but sports—is the word that flashes from signal yard to signal yard. From that moment, every officer and man becomes as enthusiastic about winning cups and trophies as he is before and after to get the highest score in the "Hits-per-Gun-per-Minute" contest. Afloat and ashore "jack" disports himself. An exhaustive program is prepared for his entertainment and uninterrupted pleasure. It is his reward for the months of faithful work just ended.

Of all sports, boat racing is the one that arouses the greatest interest. It is the never-ending theme of discussion and rivalry. For months the ships have been preparing for the races. Every afternoon after four o'clock, when the day's work is done, and on the regular Saturday afternoon half-holidays, boats of every sort may be seen putting off from the ships' sides. Each candidate gets his chance to pull an oar under the critical direction of coxswains, whose sole ambition becomes to develop a "winner." Whale-boats, cutters, and the rest of the ships'

Boat Race

regular boats are pressed into service. The interest is intense, for on the collective achievements of all these crews during *the* week depends whether the ship wins the Boat-Pulling Trophy.

The English system of more general athletic participation, rather than individual excellence, has gained a strong hold on the Navy. No man is "forced or entreated" to take part in any sport, but every man that wishes is given the opportunity for the asking. But, love as he may the scrub games, the bluejacket of our "National University," like his fellow-student of the college on shore, can never give up the idea of the 'Varsity, and, afloat as on shore, we therefore have the picked few upon whose efforts depends the honor of the ship. In the pulling races, that responsibility rests with the race-boat crew, those well-developed oarsmen, twelve in number, who, year in and year out, keep in training and strive to retain their places in the boat in the eager competition of the aspiring "oars." Every afternoon, under the vigorous direction of their coxswain, they leave the ship for an hour's pull round the fleet, and then go through a course of gymnastic exercises that, for some people, would in itself constitute a hard day's work.

The true test of those hours of preparation is now at hand. The race-boats of the fleet, representing each of the seventeen battleships present,

are lined up between the two stake-boats at the wide entrance of Guantanamo Bay. "Are you ready?" Then the loud report of the one-pounder in the bow of the referee's steam-launch. They are off. It is a test of real oarsmanship, for the boats are precisely the same as to size, equipment, and weight. Like all navy boat-races, it is a "one design" class race, in which the boats vary only in the small features that the boat-builders themselves cannot control.

The present contest is for the Battenberg Cup, the handsome challenge trophy presented to the Atlantic Fleet in 1905 by the enlisted men of the British Second Cruiser Squadron, commanded by Rear Admiral H. S. H. Prince Louis of Battenberg, R. N., "in grateful remembrance of the many kindnesses, tokens of good-fellowship and wonderful entertainments that were given to them, in cordial friendship, by their comrades across the sea."

In the letter forwarding this acceptable token of good will, the request was made that the trophy should be considered a perpetual challenge cup. Many spirited contests have been held for it, since it was first raced for in 1906, when the honors went to the *Illinois,* and it has ever been regarded as the most valuable racing trophy among the many in the possession of the Atlantic Fleet. The boats used are the standard twelve-

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CHART SHOWING THE DISPOSITION OF THE SHIPS'

In the Atlantic Ocean is found both the greatest numerical and the chief military strength of the navy. Far to the north, in the Gulf of St. Lawrence, but not shown on the map, is the naval tug *Potomac*, bound on an errand of mercy, to rescue the crews of American fishing vessels, but herself caught in the ice-floes. At Portsmouth, N. H., a cruiser is undergoing repairs. At Boston the battleship *New Jersey* is being overhauled, the armored cruiser *North Carolina* and the cruiser *Chicago* are in reserve, and a new submarine is being placed in commission. At Newport are four old torpedo boats and a submarine in reserve or being fitted out.

At New York the battleship *North Dakota* is repairing, the battleship *Arkansas* is being drydocked, the armored cruiser *Washington* is acting as receiving ship, and a monitor and submarine are preparing for sea.

At Philadelphia are stationed the battleships and cruisers of the Atlantic Reserve Fleet, a repair ship, a scout cruiser, two destroyers, and a submarine.

At the Naval Academy at Annapolis are five torpedo boats, and at the Washington navy yard are two converted yachts, while at Norfolk are the battleship *Vermont* and a monitor. The battleship *Michigan* is at sea, off Cape Hatteras, proceeding south to join the ships at Guantanamo Bay.

Charleston, S. C., is the regular base of the torpedo boats and destroyers in reserve, but only five of the former and three of the latter, together with one submarine, were there on February 12. The others were on the coast of Florida making their annual two months' practice cruise. At Key West are three new destroyers engaged in "shaking down" trials; in Pensacola Bay the battleship *Mississippi* is being used for experimental aeronautic work; while at New Orleans a monitor and the second submarine group are engaged in their annual manœuvres and exercises.

Off the north coast of Cuba the *Prairie* and *Hancock*, transports, are returning with two regiments of marines from a month of "advance base" work on the island of Culebra. South of Cuba, at Guantanamo Bay and Guacanayabo Bay, are all the ships of the Atlantic fleet—except those stationed in Mexican waters—engaged in the regular winter practice work of fleet and division drills.

THE UNITED STATES NAVY ON FEBRUARY 12, 1914

On the east coast of Mexico, performing an obvious duty, are seven battleships, two cruisers, and one gunboat. At Cristobal, the Atlantic end of the Panama Canal, are five submarines with their "mother" ship. Off the coast of Honduras an auxiliary is engaged in hydrographic surveying. And finally about the island of Haiti are a battleship, an armored cruiser, two cruisers and a converted yacht, keeping the unruly element in restraint and maintaining the peace.

In the Pacific Ocean, the Asiatic fleet has concentrated its main force in the Philippine Islands, where we find three cruisers, two monitors, a gunboat, five destroyers, six submarines, and four auxiliaries. The remainder of the fleet, seven gunboats, are shown maintaining their station in the Yangtse river in China and near Canton, where a patrol has always, of necessity been kept.

Moving eastward on the map, our next vessel is seen at the Island of Guam, serving as station ship for the island government, which is conducted with conspicuous success by an American naval officer. The same statement can be made of our other navy-governed possession of Tutuila, or American Samoa, where a gunboat is maintained as station ship.

In the northern Pacific no vessels have yet been stationed. This is, however, only a temporary condition as the completion of the Pearl Harbor naval station will make this base our most important strategically, in that sea.

On our own shores, we find the Pacific Reserve Fleet of one battleship, the *Oregon*, eight cruisers, two submarines and five auxiliaries in Puget Sound. At San Francisco are two cruisers, a gunboat, four submarines, four destroyers, two torpedo boats and one auxiliary. Near Santa Barbara and San Diego five torpedo boat destroyers with a parent ship are engaged in various exercises. Two submarines and two armored cruisers are also in those waters holding target practice, while further south, on the west coast of Mexico, are an armored cruiser, two cruisers, one gunboat and an auxiliary, maintained there for reasons well known. Still farther south the cruiser *Denver* is proceeding to relieve the transport *Buffalo* at Corinto, in Nicaragua, where for some time the State Department has considered the presence of an American warship desirable.

oared Navy racing cutter, and the length of the course, three miles straight-away, between the lines of battleships anchored in column of squadrons. The ship of the winning crew becomes the proud holder of the trophy until challenged by another ship of the fleet, when she must defend her title against the challenger and any other ships that may wish to enter the race.

In drawing up the rules governing the races for the Battenberg Cup, a clause was inserted by the American admiral that any British vessel might also compete for the trophy, provided she pulled in a standard American Navy racing cutter loaned to her by one of the United States vessels present, and that, should she win, her name should be inserted upon the cup. During the seven years in which the trophy has been competed for thus far, only one British ship, the cruiser *Argyle,* by her victory in the splendidly contested race in Hampton Roads during the Jamestown Exposition regatta, has won the coveted distinction, and hers is the only name so inscribed, though other English vessels have shown their sportsmanship by challenging whenever possible. In 1908, H. B. M. S. *Powerful* and *Challenger* made gallant efforts in Australian waters, and, in the year following, the *Drake* succumbed, only after a gruelling contest, to the superior oarsmanship of the *Minnesota's* race-

boat crew, which in turn had to yield the palm to the *Georgia* in 1910 and 1911, to the *Missouri* in 1912, and, during the past year, to the *Florida*.

But the Battenberg Cup race is only one of a series of most keenly contested competitions held each winter, spring, and summer, at Guantanamo Bay and in Narragansett Bay, for the battleship, destroyer, and auxiliary trophies. All these contests are strict "one design" races, limited to certain classes of boats, and sometimes restricted even in the composition of their crews. The Battenberg and Coffin trophies must be rowed for over a three-mile straight-away course in twelve-oared navy racing cutters pulled by the regular race-boat crews; the Jamestown Cup, presented in 1907, by the Board of Governors of the Jamestown Exposition, is for racing cutters manned by commissioned officers of the Navy and Marine Corps; the Belmont Cup, originally donated in 1897 as an apprentice challenge cup, is likewise to be competed for in racing cutters, but their personnel is limited to men of the deck force of first enlistment. Then there is the Drexel Challenge Cup, raced for since 1905, by the enlisted men of the battleships' engineer forces; the San Pedro Cup, presented by the citizens of San Pedro in 1908, for sailing-launches under oars; the Narragansett Bay Cup for standard navy racing cutters not manned by

A Sailing Race

race-boat men; the Dunlap Challenge Cup for Marines; the Havana Cup, presented by the United States Club of that city in 1899, as a trophy for gigs, but now raced for in whale-boats; the Duncan Cup for scratch crews in regulation dinghies; and finally, the Pensacola Challenge Cup, which is won on the greatest number of points made in races for twelve-oared cutters, double- and single-banked whale-boats, and dinghies.

There are cups for sailing races also—races in sailing-launches for the Colonial Dames Challenge Cup, races in whale-boats for the Neeser Trophy, contests for cutters and dinghies, and, during the winter and summer regattas, for the Department Sailing Trophy. The greatest interest prevails when these tests of seamanship are held, but none, perhaps, appeals to the men as much as the "free-for-all" race that bi-annually rouses every officer and man in competition for the Thompson Trophy. For in this contest any boat carried by any vessel of the fleet, propelled only by sail power, may be entered. No restrictions of any kind are imposed; any amount or kind of sail, false keel, additional rigging, bowsprit, jibboom, or spar, may be used, and the originality displayed in this contest may be said to be rivalled only by that in the one-mile pulling race in sailing-launches,

where unlimited crews are allowed. In this latter event, last summer (1913), one ship, taking advantage of this leniency in the rules, not only crowded every available oarsman on the thwarts, but in addition massed the ship's band in the stern sheets. The minute the starting gun was fired, every oar caught the water, and the band struck up the stirring air of "Marching to Victory."

While the boat racing is generally conceded to be "jack's" favorite, and the Navy's time-honored sport, the question of second choice can really not be as satisfactorily settled. The winner of the Fleet Championship Boxing Belt in any of the classes of bouts held on board ships of the Atlantic Fleet is no mean personage in the eye of the thousands who witness the sixty or eighty boxers entered in the annual tournaments that form so great a feature of the smokers given by the various entertainment committees of the several battleships. The rules governing these contests are most carefully laid down and as strictly enforced. There are seven classes of bouts, from bantamweight to heavyweight; six-ounce gloves must be used in all contests; the rules of the A. A. U. govern, except where they conflict with the fleet athletic regulations; for every bout there must be two judges and one referee; no man may enter the ring until he shall

have been examined by the surgeon of the ship to which he is attached, and pronounced physically fit for the contest; and no bout shall go more than seven rounds of two minutes each, with one-minute rests between the rounds. It is in the evening that the scene is laid for these heroes of the ring, and well does "jack" fit the setting to the occasion. A large stage is rigged on the forecastle or quarterdeck, with dropcurtains and regulation flies and wings. The band has rehearsed a special program for the audience's entertainment. Rows of chairs fill every available deck space, while on the turrets and cranes and masts there is "standing room only" when the ship's bell strikes eight. As a fitting introduction to the main part of the program, the ever popular minstrel show, with its songs and dances, and jokes and sketches, holds the center of the stage; and then follow the bouts, the star acts, which appeal to every man from the admiral down to the youngest bluejacket. At every favorable opportunity a smoker is given. Each ship takes her turn in acting the part of "hostess," thereby returning the hospitality of her consorts. The captain entertains the captains of the other ships; the wardroom invites all the officers of that particular mess throughout the fleet; the junior officers, their contemporaries; and so on down the line to the enlisted men themselves. It is fun,

real fun, and everyone has a good laugh and a good time.

But what of the National Game? To many a landsman the sight of jack tars navigating the base paths and sliding for home plate may seem incongruous and un-nautical. Yet, strange as it may seem, the bluejacket loves the sport as much as the most rabid fan of professional baseball, and, whenever the opportunity offers, needs but little urging to get him out on the field when a diamond lies within hail. It is seldom difficult, therefore, to get together a good team from the nine hundred men on board each battleship, and even the auxiliaries and destroyers, and the tiny submarines, have their nines, each as well equipped, and, in many instances, as well trained, as the average minor league team.

It is only in recent years, however, that baseball has been on an organized basis, with a full schedule and a regularly accepted process of elimination, aiming to bring together the best teams of the fleet for the final championship games. The official fleet baseball schedule now comprises one big league, divided into six different parts. The rivalries are first settled in each of the four battleship divisions, the destroyer division of twenty boats, and the division of auxiliaries. Each ship plays every other ship of its division once in the preliminary series; then the

The Kansas's Race Boat Out for a Practice Pull

leaders of the several divisions meet in a three-game series, and lastly comes the final series of five games between the two best remaining teams for the twenty-foot-long championship pennant and the gold baseball watch charms awarded each member of the winning nine.

As early as the first of January, the ships' teams begin their "spring training trips," many weeks before the big professional league players pack their grips for the Southern training camps in answer to the call of the diamond. For this the Navy again has Guantanamo Bay to thank. With the assembling of the fleet within its sheltered harbor, it is "baseball party ashore" every afternoon after four o'clock, and on Saturday and Sunday afternoons. For the first six weeks the ships' athletic officers and the team captains have their hands full trying out the hundreds of candidates, and determining the final make-up of their nines. One officer may play on each team, if he can make it, but there is no favoritism shown and every man must continually be on his toes to keep the position he has won over his eager competitors. The coaches are almost invariably officers, Naval Academy graduates who played on the Navy team in their midshipman days; but the captains of the ships' teams are always enlisted men.

Whenever circumstances permit, the complete

schedule is played off at Guantanamo Bay. But sometimes the work of the fleet renders this impossible, and the setting for the championship games is then transferred to Newport, where the sailors have been allowed the use of the splendid diamonds in Wellington Park. Here, in the summer week-ends, the final encounters are staged. Every man that can be spared from duty is on the side lines to cheer his favorite team, and not a few of the inhabitants also visit the field to witness the spirited contests between the men of the different ships. All day Saturday, practically, and Sundays after two o'clock in the afternoon—church services having been held at ten o'clock and the men's dinners at noon—are devoted to outdoor sports, and, as one officer justly remarked, this way of spending their time is of vastly more benefit to the bluejackets than keeping the seven or eight thousand of them locked up in the ships or landing them simply to roam about a small and half empty town. Some diversion has to be furnished, and in baseball the Navy has found the solution of a problem that for many years was the despair of every officer and man afloat.[3]

Of the various other sports, the most important, from the military point of view, are those

[3] An interesting discussion of this question may be found in Admiral Evans's *An Admiral's Log*, p. 349.

The Connecticut's Landing Force Going Ashore

pertaining to swimming, shooting, and signalling. All three are nautical sports, essential to the bluejacket in his work, and their inclusion among the events counting towards the Department General Excellence Trophy has resulted in a happy combination of play with work. Great importance has always been attached to teaching the men how to swim. From the day of their enlistment as apprentice seamen, the bluejackets learn how to take care of themselves in the water, and with the opportunities afforded by the warm waters of the tropical seas in the winter months, there has been little difficulty in arousing a general interest in the Assistant Secretary's Swimming Cup. The money prizes offered by the Navy Department for the enlisted men's rifle team matches and the handsome trophy presented by the citizens of Auckland, N. Z., in 1908, for the officer's matches, also aroused from the first a new feeling towards this phase of the navy's work, and the great progress in marksmanship with rifles and pistols that has within the past few years marked the fleet's work, is sufficient evidence that the right kind of spirit has been aroused. Mention must also be made of the Correspondents' Cup for Signalling, presented by the newspaper men who accompanied the Atlantic Fleet on its globe-circling cruise some years ago, which trophy also aroused a new

interest among the men in their work on the signal-bridge, and materially encouraged them to attain perfection through constant practice by day and by night.

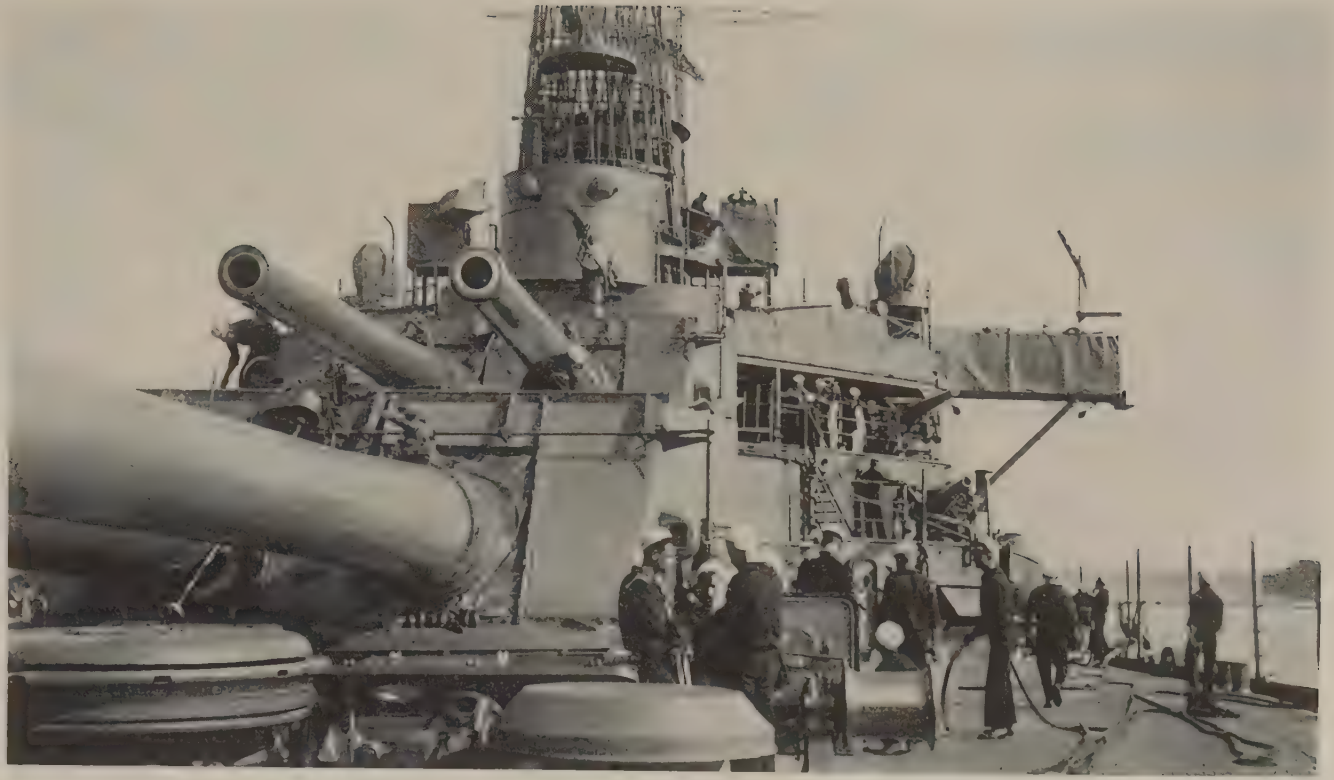
This spirit of competition that has sprung up in athletics has, without doubt, been a great asset to the navy in reaching its present state of efficiency. Officers and men have learned to play hard as well as work hard. Drills, routine duties, manœuvres, target-practice, and sports have their allotted times in the fleet's annual schedule. Every possible encouragement is given to athletics, once the day's duty is done, and this happy mingling of work with play has had a naturally excellent effect upon both the physique and morale of all concerned.

THE SAILOR AS SOLDIER

Though it may be generally appreciated that the two main branches of a nation's military force are its army and its navy, whose fields of operation are respectively on shore and afloat, it is not a matter of common knowledge that the navy, unlike the army, is often called upon to operate not only upon its own particular element, the sea, but also upon terra firma. Yet this has ever been so. The very first oversea expedition entered upon by the United States navy, against the Island of New Providence in the winter of 1776, was an offensive operation in which the ships' crews were called upon to attack the enemy upon his own chosen ground. And since that date it has been necessary for the navy, in more than a hundred instances, to land parties of sailors and marines in every part of the globe. The enemy may not have possessed a single ship, yet the navy has had to act in the field against him. In Sumatra in 1832, in the Florida Indian wars of 1836 and 1841, in the Fiji Islands in 1840, at Montevideo in 1868, at Alexandria, Egypt, in 1882, and in Nicaragua in 1912, our sailors have been called upon to do what the army was not in a position to attempt. The acquisition of

California in 1846 would never have been possible had it not been for the presence of our bluejackets under Stockton and Du Pont; the horror of a fanatical massacre would have defiled the recent history of China had not our naval brigades co-operated with those of England and the other allies in 1900 in relieving the besieged legations and sheltering the foreign residents of Pekin and Tientsin; and our Far Eastern policy would never have had the position which it occupies today had it not been for the stand taken by our naval officers before the Barrier Forts of Canton in 1854 and in the Salee River, Corea, in 1871. Often the navy has also actively co-operated with the army in shore operations, as at the Battle of Bladensburg in 1814, at the first Battle of Bull Run in 1861, during the dashing assault upon Fort Fisher in 1865, and, more recently, in our efforts to restore peace and quiet in the Philippines. Even where the navy has had no actual hand in operations, it still has been back of the army and co-operating with it. No one can study the campaigns of our own Civil War without realizing how different would have been its outcome had it not been for the part played by the Union sea forces.

The task of peacemaker, then, has been a rôle that the navy has been called upon to play, and play well, on more than a mere score of occasions.



The Wyoming's Forecastle

And it has been a duty calling for a display of the rarest tact and diplomacy. For, though the landing of a nation's marines and sailors on foreign soil for the purpose of maintaining peace and order may not, by international custom, be construed as an act of war, the invasion of an army expeditionary force would in all probability be so regarded. The actions of the officers and men employed in landing duty have an influence upon a situation that is bound to be far-reaching and is, in many cases, decisive.

It is, however, no case of "soldiering on a rope."[1] Our bluejackets may have to learn most of their infantry drill and manual of arms with decks aslant, and may have a peculiar, deep-sea manner of doing "squads right" and "port arms," at the same time climbing toward the starboard rail, yet when they go ashore, they swing past the reviewing stand with a precision of movement that would do credit to the foreign legion of France, the best marchers in the world. And what is more, the minute their services are needed on shore, the instant the bugle-call sounds, they stand ready to give an exhibition of courage and conduct under fire, or under any other trying conditions, that deserves more than praise. But they hate it, hate it cordially and whole-heartedly, for it is not sailoring in their eyes.

[1] A seaman's term for "loafing."

Yet the fact that, in practically every oversea expedition in which the army and navy of a nation have been concerned, the navy has furnished the advance force in the landing operations, has time and again emphasized the necessity of familiarizing the crews of our ships-of-war with the work which they may be called upon to perform on shore. To this end a limited experience in camp each year has been found most desirable—a few weeks of the winter and summer schedules when the landing forces of each ship may be put under canvas on the "beach," and drilled in the essentials of scouting, patrol duty, and outpost work.

Mention has already been made of the admirable location which the navy obtained some years ago for its winter drill ground in Guantanamo Bay. The possession of that beautiful sheet of water solved many of the battle-fleet's problems, but none more than those bearing on the training of its enlisted men as soldiers on shore, without wasting their time with the various petty duties that, during that particular portion of the schedule, could as well be attended to by the "stay at homes." The various rivers and inlets, beaches and hillocks, furnish just the settings for the practice of armed-boat expeditions, and for offensive and defensive shore operations. Morning after morning boatloads of bluejackets, provi-

sioned for several days and armed to the teeth, can shove off from their respective ships and engage in the various duties that, in time of actual war, would be required of them in scouting and reconnoitering, keeping navigation open in small streams, surprising and boarding the enemy's ships, and other details of blockade duty. In addition, the high bluff of Deer Point, on the eastern shore of the bay, can be converted into a real tent city. Twelve hundred and fifty men may there be housed under canvas, and martial law established on the sun-baked tidal-plain that nature offered us for conversion into the finest small-arms target range in the world. The blue-jacket's training as soldier is thus actually begun.

Each ship of the navy has its allotted period of shore duty, and, in order that there may be no misunderstanding as to how her landing force should be organized and drilled, the Navy Department many years ago began publishing "Landing Force and Small Arms Instructions," that recently have been revised and issued in a five hundred page volume, which covers every possible contingency from first-aid to artillery regulations. "Each ship and squadron," begins the opening paragraph of the 1912 edition, "shall have a permanently organized landing force, composed of infantry and artillery." This force, for purposes of instruction and in order that the

maximum number may be ready for service on shore in an emergency, is as large as possible, and is formed from the fighting-divisions of the ship, the gun-divisions and the powder-divisions, but it is doubtful whether, under actual service conditions, ever more than one-half of this organized body would be landed at any one time, since a sufficient number of men must always be left on board to care for the ship, move her engines, and man her battery.

The unit of this organization is the section of twenty-four men, commanded by one commissioned officer and three petty officers. When acting as infantry, two of these sections form a company, and the joining of the several companies into battalions, regiments, and brigades follows closely that prescribed in the army regulations, while the artillery sections conform to the platoon and battery organization of the field artillery service on shore. Of course the usual special details are always included in every landing force thus organized—pioneers, electricians, and locomotive engineers to take charge of electric plants and railroad property, a gun-cotton party to blow up bridges and fortifications, signalmen, an ammunition-party, an ambulance-party, and the necessary commissariat and messmen. Every man is fully equipped for "distant service." He has his packed army kit,

his rubber-blanket and overcoat, his rifle and cartridge-belt, cup, water-filled canteen, and leggings; also his rations, knife, fork, spoon, and plate, and perhaps an additional luxury in the form of a frying pan; and likewise his blanket, extra clothing, socks and shoes, and watch cap. Thus equipped, "jack" is ready to go anywhere, and he goes!

In the larger landing forces there are also the usual regimental and battalion staffs found in the army regimental organizations.[2] The regimental-commander, appointed from among the captains in the fleet, has the necessary officers detailed to his personal staff—the regimental-adjutant, quartermaster, ordnance-officer, commissary, surgeon, signal-officer, and aides—who are accountable for the efficiency of their various branches. How important their duties are is not often appreciated. But the training they have received on shipboard, due to the conditions of sea life, has been such that they are almost invariably qualified for the tasks devolving upon them, and the resulting efficiency of our naval landing forces has generally been due to the intelligent understanding by these leaders of the work before them

[2] The organization of the battle-fleet into four divisions, each of four ships, is the reason for the designating of the landing force of a division (four or five battalions including the marine battalion) as a "Regiment" and the total force of the fleet (four regiments) as a "Brigade."

and to the way in which that spirit has been conveyed to their men in the company ranks.

Since various points have generally to be considered before throwing a landing force on shore in an enemy's country, the task of landing a ship's or a fleet's armed force is one calling for more than ordinary caution. The time and place of such landings depend largely upon circumstances and emergencies. Ever so many factors have to be taken into consideration. The enemy's position must be accurately known, and the presence in the vicinity of fortifications or defenses; the available charts have to be carefully studied for the topography of the country to be entered and the roads by which the force is to advance; the beach in the neighborhood of the landing place selected must not afford cover for an enemy's force, and such landing place should, if possible, be under a lee, where the rise and fall of the tide have been ascertained, and where there exist good holding ground for the covering-ships to anchor, or safe waters for them to manœuvre during the landing.

At the appointed hour, the embarkation takes place. The cutters and large whale-boats are filled with the infantry sections, one section complete in each boat and seated so as to be ready to deploy the instant the boats ground on the beach. The artillery sections, with their three-inch field

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THE U. S. S. THORNTON IN A GALE

pieces, are embarked in the sailing-launches and large cutters. At the signal from the flagship, the boats of each ship are formed in column, in tow of their respective steam-launches, which are armed with machine guns mounted in their bows. Carefully shelling the beach, searching out all points where an enemy may be concealed and keeping up a heavy fire, the flotilla of boats approaches the shore. Then at the whistle-signal of command, the boats cast off, catch the water with their oars, rush in under cover of the fire of the steam-launches, and pour out their sections upon the beach. In a moment the companies are formed; in the next instant, the loose-knit lines of skirmishers have disappeared into the country beyond.

But the chief object of the fleet's visit to Guantanamo Bay is to make full use of the wonderful small-arms target range which the service has been fortunate enough to find, practically ready made, within hail of its moorings in the waters of that bay. Not half a mile behind Deer Point, at the head of a small inlet extending behind that bluff, yet concealed from view from the bay, is that remarkable tidal-plain, under water during the rainy season, but dry and level as a ship's deck during the winter months when the fleet visits the Caribbean. The Bureau of Ordnance of the Navy Department in Washington at once

appreciated this opportunity offered by nature. It set to work with a will, and, with the expenditure of a merely nominal sum, turned the sun-baked plain into the finest and largest small-arms target range in the world.

That no precious moments might be wasted in making the trip to and from the fleet to this now invaluable spot, it has been the custom, from the first, to send on shore an entire regiment at a time to camp on Deer Point. On its high bluff, twenty feet above sea level, the bluejackets pitch their tents, by companies and battalions, and install their galleys, incinerators, and mess tents. Here, under canvas, they learn the drudgery of the soldier's life. The strict discipline of camp routine is constantly enforced. While the stars are yet blinking in the firmament, and the cold night air still chills the pacing sentries, the bugle blows the reveille. Over the waters of the bay comes the sound of two bells. It is five o'clock. A general rush down to the dock at the landing place follows, a plunge into the refreshing waters of the bay, a quick rub, a moment for dressing, another to make beds (the men sleep in camp cots on shore), and everyone is ready for the breakfast now awaiting him. After that every man carefully examines his rifle, wipes off the grease with which he has smeared it after cleaning the evening before, and it is "Fall in" for

On the March

the target range. At that moment the dawn is beginning to break, the sun rises like a ball of fire from behind the Cuzco Hills, and the day's work has begun. "Forward March." The regiment is off for the target-practice. From seven in the morning to five in the afternoon every man is "up and at it." Under the heat and glare of the tropical sun, section after section comes upon the range for instruction in small-arms firing with rifles and pistols. Every man receives individual instruction from the section commanders, most of whom are expert shots and veterans of Camp Perry and other international matches. The mechanism and workings of the Springfields have already been carefully explained to the men, and all have been through the monotonous sighting-drills on ship-board until every man knows just how much of his front sight to show and what is meant by a full-sight, fine-sight, or half-sight. One by one the men are put through the course of instruction, first at slow fire, then at rapid fire and skirmish fire. Then, if they have made a qualifying score, they are graduated to the sharpshooters' course, and finally to the expert riflemen's range. At 25 and 50 yards their scores are made with pistols; at 200, 300, 500, 800, and 1,000 yards with rifles. As in everything else that the navy does, competition has become no small factor in the

final success of this phase of the bluejackets' work. It is man against man, section against section, company against company, and ship against ship. Cash prizes, as well as medals, are offered for excellence with small arms, while to the ships of the Atlantic, Pacific, and Asiatic Fleets making the best performances for the year with these weapons the Navy Department awards silver trophies that are highly prized by the crews winning them. But the final reward to these riflemen comes still later in the year when the teams are selected, from among the officers and enlisted men who have made the best scores, to represent the navy in the annual National Small-Arms Matches at Camp Perry.[3]

For weeks the reports of the Springfields are incessant, the rattle of musketry interrupted only by the booming of the three-inch field guns on the artillery range in the hills beyond and the reports of the one-pounders and gatling guns that, mounted in the bows of the steam launches, are covering the landing of some ship's battalion in

[3] Among the many interesting rifle matches in which the navy has in recent years participated may be mentioned the one held at Portland, England, in November, 1910, between teams from the U. S. S. *Connecticut* and H. B. M. S. *Dreadnought*, which the former won by the score of 806 to 785. The *Connecticut's* team was composed of four ensigns, one midshipman, one turret captain, one coxswain, one ordinary seaman, and two marine privates; that of the *Dreadnought* of four officers, one petty officer, three seamen, one corporal, and one private.

A Skirmish Drill

the neighborhood of Lighthouse Point. But there is also other work to be done. While five hundred of the men from the ships' landing forces then in camp are breaking records on the firing line and marking the target-screens in the pits, the seven hundred not thus engaged are working against time on another part of the tidal-plain which answers the purpose of a parade ground, or among the Cuzco Hills, where a veritable jungle challenges the skirmish lines of the white-clad sailor-soldiers. What is to be done is included in the hundreds of pages of the regulations and instructions. Outposts, patrols and scouting parties are sent to scour the country far and near, the marching columns are practiced in every art of advance- and rear-guard duty, "hikes" innumerable are held until the men become as familiar with the topography of the naval reservation as they already are with every compartment of their own ships. Once in a while the battalions are sent over the twelve-foot wall that circles the station grounds, while at other times field works are erected, and the men instructed in the details of extended order drill and night operations. The infantry drill regulations are drummed into all until the manual of arms, the school of the recruit, and the school of the squad are known by heart from cover to cover. Two weeks of this work every man of

the deck divisions has, two weeks of hard, dirty work, until "jack" longs for the day when he may return to his home afloat, that one and only spot where fresh water flows in abundance and where he may keep his whites immaculate without having to resort to his pail of water and cake of salt-water soap three or four times a day.

But, while trudging along thus in soldier fashion, the spirit of the sailor, that indefinable, inimitable something, is ever there. It is always breaking out in some manner, in a remark or in an action, which gives an atmosphere of salt-water ways to the infantry column never found among the "dough-boys." Yet among "jack's" thousand shipmates on board his own ship are some seventy men who *are* soldiers by profession, soldiers whose real work is upon terra firma, though they are a branch of the sea service.

When the King of England, in 1664, created the "Duke of York and Albany's Maritime Regiment of Foot," he established one of the most important and interesting naval innovations ever devised by seaman or landsman. It was an innovation indeed, a bold departure from tradition, but one that did wonders for the sea service and thenceforth assured each ship a certain number of trained marksmen and riflemen upon whom the British naval captains came to depend when there was need to clear an enemy's decks

A Wall-Scaling Drill

or board a hostile ship. Today only American and British warships carry marines. The French have their "Infanterie de Marine," but it is a land force, and a land force only, for service in the colonies and outlying possessions.

To some few it has seemed as if the marines had outlived their usefulness on board ship. At one time their banishment to shore routine was actually decreed and effected. But the legislative history of our marine corps shows that it was created[4] in the very beginning for sea service on board vessels of war, and for sea service only. Sea service brought it forth, and sea service has perpetuated it. For one hundred and thirty-eight years our own marines have slung their hammocks between decks and done their share of the work, and experience has demonstrated beyond a doubt that they have worked well aboard ship with the sailors, and that, on the other hand, when exigencies have demanded service ashore, our bluejackets have worked well there with the marines. The recent campaign

[4] In October, 1775, by special act of Congress. No question is so little understood as the relation between the marines and the navy. That useful and renowned corps was not originally formed as an instrument to repress seamen, but because it provided cheaply and readily a supply of reliable and disciplined men to complete deficiencies when the ships of war were mobilized. It is true that at times experience showed that the marines were a useful counterpoise to the seamen, but this advantage was quite secondary.

on Nicaraguan soil confirmed this beyond a doubt.[5]

That the marine corps has become the mobile force that it now is, is no doubt due to the sea habit acquired since its establishment on board vessels of the navy by a portion of its force and distributed from that portion throughout its entire personnel serving elsewhere. The experience gained by its rank and file as a component part of the ship's organization has had a worth to them and to the naval service that can never be overestimated. Only by service *there* has the naval purpose of the marine been realized, and the familiarity with naval methods acquired on the forecastle by the private has had an effect upon his individual efficiency that none can appreciate more than he. To these conditions, to the varied experience of its officers and men—an experience gained in every sea and in every clime—the marine corps owes the qualities that have developed its personnel into the highly trained, efficient mobile force of naval infantry

[5] In the attack on Coyotepe Hill, a bluejacket from the armored cruiser *California,* carrying the colors, was one of the first with the marines to reach the enemy's trenches at the top, while at Nindiri, a landing force of marines and bluejackets (the latter with their snow-white uniforms intentionally soiled and besmeared with mud lest they be removed from the assaulting column because of their conspicuous "rig") rushed a practically impregnable position with an enthusiasm worthy of Thomas's troops at Missionary Ridge in 1863.

ready and available for naval use. Today the corps is primarily an adjunct of the navy, a mobile force, stationed on board ship, in the home ports, and at the advanced bases, always ready to act in conjunction with the navy in preserving order beyond the territorial limits of the United States and in occupying strategic points in advance of the army when to move the army would occasion war. The number on shore is based upon the necessary brigade organizations; the number afloat provides for a full detachment on board each of the large ships of the fleets.[6] And it is this last detail, the actual cruising at sea, that keeps the marine corps in touch with naval conditions and so mobile that on a few hours' notice it could start for any place where its services were needed.

The marines make of the navy both an army and a navy. They give the navy an army of ten thousand men, a force of the most mobile character, which can be rapidly concentrated, occupy important coast positions and, perhaps, go far to settle an important war long before it is possible for an army even to begin its concentration. The marine corps can be carried to the most distant points without effort, it has the best bases of

[6] The Marine Corps is the one branch of our fighting service which is always recruited up to full strength. At the date of writing (December, 1913), there was not a single vacancy in the entire corps.

supply, and its acts, in most cases, cannot be construed as war unless one wishes to make them war. It is a great instrument of which we do not always appreciate the value, an instrument which, by a peculiar existing custom and international understanding, if not by law, we can land upon foreign soil for the protection of our own and foreign citizens, without being precipitated into a war. Even the President of the United States and his Secretary of War did not grasp this difference between the uses of an army and a naval force a few years ago when the Nicaraguan difficulty called for immediate action on our part. A regiment of soldiers was actually under orders to leave the Canal Zone for Nicaragua, when the Executive, fortunately, was informed of his error, the order rescinded, and the matter left to the navy. Battles were fought, and we lost several men, but it was not called war.

Disembarking the Landing Force

THE WORK OF THE TORPEDO FLOTILLAS

From the days when the might of Britain began to assert itself in maritime affairs, the line-of-battle-ship has been the unit of strength by which the sea-power of nations has been judged. It was so in the time of Nelson and Rodney, when the decisive engagements were fought out with the crushing force of the great three-deckers. It is so today. The Battle of the Sea of Japan did no more than to confirm the lessons of the past, giving tragic demonstration of the unalterable fact that the ultimate deciding battle of a naval campaign must be fought out, broadside to broadside, between the larger ships clothed with heavy armor and armed with the most powerful long-range guns. This has been the teaching of history. But, within the past generation, three engines of war have been successfully developed, agencies of destruction which, in the future, are bound to have a potent influence upon the struggles for the control of the sea. They are the automobile torpedo, the submarine, and the aeroplane.

History, however, cautions us not to over-estimate too hastily the prowess of these remark-

able inventions. The moment the torpedo rose above the experimental stage, it was heralded as "sounding the death knell of the battleship." No vessel afloat could withstand its terrible effects; therefore, serviceable sea-going ships were doomed; and the pneumatic dynamite gun, which followed a few years later, was announced as certain to accomplish what its predecessor had failed to do. Then came the test of actual service, and both the torpedo and the dynamite gun were shorn of most of their terrors.[1]

But if the nations of the world once again realize that the trend of modern naval operations is more and more toward the open sea, and that the issues of future maritime wars will be determined in great fleet engagements between battleships upon the high seas, where the submarine will not care to venture and the torpedo boat may not find its proper sphere of action, it does not follow that the lessons of those years of experimentation with torpedo craft have been entirely futile. On the contrary, every effort has been made to develop and perfect the torpedo, and render it a practical weapon that can be relied upon to fulfill its particular functions with every probability of success. From a crude affair, dangerous alike to friend and foe, the torpedo has grown into a powerful projectile,

[1] The same may be said of the ram.

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CHARGING THE TORPEDOES ON A DESTROYER

seemingly endowed with wise control over its own actions, and effective even at battle range; while the frail torpedo-boat of the nineties has given way to the cruising destroyer, capable of service with her larger consorts on the high seas of every latitude. But with this there has come also a better appreciation of the true functions both of the torpedo and of the vessel that is to wield it,[2] and a clearer understanding of the proper subordinate sphere to which the activities of both would have to be relegated under actual service conditions.

When the Americans first taught the world the power of the torpedo, that weapon was of the most makeshift description. It consisted merely of a powder-filled shell, mounted at the end of a long pole guided by human hands from the bows of a picket launch. Yet, crude as it was, the destructive possibilities of the torpedo received terrible illustration. No less than six vessels were blown up by torpedoes during the course of the Civil War of 1861, while twenty-eight other ships were sunk through the agency of submarine mines. The effects were far-reaching. Their possibilities set naval men to thinking.

The modern automobile torpedo, however, was

[2] The function of the torpedo on board a battleship, however, has passed from a defensive to an offensive weapon.

evolved from the brain of an officer of the Austrian navy. His ideas were crude and unworkable, but his experiments so novel that they attracted the attention of Mr. Whitehead, who, in 1864, was managing an engine manufacturing company at Fiume. The Englishman's mechanical skill in a short time perfected and made practical the plans evolved by the Austrian. From that day the new weapon grew by leaps and bounds. At first it was exceedingly erratic in its performances, and its speed, even for a short distance, was only six knots, which was somewhat disappointing. But the invention showed such promise of further improvement, that the Austrian government decided to enter upon a series of experiments with a view to discovering what its possibilities really were. So impressed were the British Admiralty that they also persuaded Mr. Whitehead to conduct like experiments in England. This recognition by the first maritime power in the world of the merits of the locomotive torpedo had the inevitable result. France, Italy, Germany, and the United States followed her example in rapid succession, until today every navy of importance is provided with Whitehead torpedoes.

The modern torpedo has rightly been termed a wonderful creation. In its nose or head it carries a war charge of two hundred and fifty

pounds of gun-cotton. Abaft the explosive chamber is an air chamber containing the compressed air which supplies the motive power. Just behind the air chamber is located the balance chamber wherein is all the automatic steering apparatus for directing the horizontal rudders, and abaft this are placed the engines which revolve a shaft traveling down the axis of the torpedo, at the extremity of which are fixed two screw propellers. And in the aftermost compartment is another small air chamber for the purpose of giving the torpedo the requisite buoyancy and containing the gyroscope for guiding the vertical rudders. Such is the plan of this remarkable engine of war, which today can be made to speed through the water, at any desired depth, at forty-two knots' speed, and with an accuracy that is almost beyond belief.

But the torpedo is an expensive toy, so costly—between five thousand and seven thousand dollars—that no navy can afford to expend a large number of them even for the purpose of drilling the men who have to fire them in battle. Yet such training is essential to success, and the problem that long confronted the service was how to do this without incurring the risk of losing the torpedoes every time they were fired in practice. The use of a small calcium phosphide torch, secured within the practice head

(used in times of peace instead of the war head containing the high explosives), finally solved this important question. Now it is possible to fire a torpedo exactly as it would be in actual service, for the torpedo, after expending all its air, will rise to the surface and there float, revealing its position by a trail of smoke in the daytime, and a bright calcium flame at night. The most serious obstacles to accurate torpedo firing—its prohibitive cost and the enforced lack of practice—have been surmounted.

Previous to firing, the various parts of the torpedo have to be carefully adjusted. The air chamber is charged with air at 2,250 pounds pressure, which, the moment the weapon is launched, is automatically fed into the cylinders of the engine. Then the torpedo is loaded into the tube, the tube door is closed upon it, and the firing mechanism adjusted preliminary to ejecting the torpedo into the water. All is then in readiness. The pointer takes his seat on top of the tube, training it by means of a steering wheel, and keeping his telescope fixed upon the target. Two essential factors still have to be taken into consideration before accuracy of fire can be assumed, and these are the making of due allowance, when firing, for the speed of the torpedo, and the speed and course of the enemy, which will not remain immovable to await the fast-

approaching missile. These difficulties an ingenious device, called a "director," has successfully overcome, and all three can be mechanically solved in a few seconds when the moment for action is at hand. The minute the cross-wires of the pointer's telescope are "on," the firing key is pressed. The compressed air charged in the tube door acts as an impulse charge and forces the torpedo through the open end of the tube at the rate of about thirty-five feet a second. As the torpedo leaves the tube, the starting valve is released, the engine begins to turn over, and the throttle automatically opens wide. The torpedo is thus launched on its death-dealing mission.[3]

The adoption of the torpedo as a weapon of naval warfare was immediately signalized by the advent of a class of vessel utterly unlike any which had hitherto figured in the navy lists of any country. It was seen that in order to give torpedoes a wide sphere of usefulness, it was necessary to build vessels of such a type that these deadly weapons could be brought to bear

[3] A single torpedo striking a battleship in her vulnerable underbody would not, however, sink her. The injury caused by the explosion of the gun-cotton charge would merely result in the flooding of a number of the many water-tight compartments into which her hull was divided, an injury that in time could be repaired—yet an injury that might keep her out of the line of battle long enough to ensure a distinct gain, and perhaps victory, to the enemy.

with every chance of success yet with the minimum of risk. The simple mode of firing torpedoes from the larger-sized ships presented too few opportunities of using them to advantage offensively. What was needed was a vessel of great speed and extreme handiness, which, on account of its smallness of size and inconspicuousness of shape, could steal in on an unfriendly ship, under cover of darkness, and fire her torpedo without being discovered. The range of the torpedo, even in the latter part of the nineteenth century, was very short, so that surprise was the essence of the torpedo-boat's being—surprise and ability to get within torpedo range before the dreaded guns of her antagonist could pick her out.

The earliest torpedo-boats were diminutive craft, mere steam cutters or pinnaces fitted with spar torpedoes, and of such limited speed that their activities were confined chiefly to sheltered waters. Their value, therefore, was very problematical. The first boat built solely for torpedo use was launched in 1873 for the Norwegian government. It was a frail little thing, fifty-seven feet long and seven feet wide. But by 1878 the length of the boats built had increased to eighty-four feet, and in 1886 to one hundred and twenty-five feet, the speeds ranging from eighteen to twenty-one knots. That was the year in which

the United States navy acquired its first vessel of the type, the *Stiletto,* built by Herreshoff at Bristol, Rhode Island. We were very proud of her in those days; yet she displaced barely thirty tons and steamed only a trifle over eighteen knots.

Yet this was only the beginning. By the time the torpedo-boat had been satisfactorily developed, and each power had acquired a fleet of them, the necessity arose for a new type of warship—a vessel fast enough to overhaul and destroy these frail yet dangerous pests. At first this new type was looked upon merely as a torpedo-boat catcher, swift of speed and heavily armed. But before long it became evident that much more would be gained by adhering to the old type of vessel, while increasing their size, thus rendering them more seaworthy and enabling them to keep the open sea when the smaller craft would be restricted to operations near shore. This spelled the doom of the old torpedo-boat. The "destroyer" now became the class favored by naval experts, and it was not long before the value of their new selection was tested under actual war conditions. The war with Spain and the Russo-Japanese conflict put the torpedo craft to new uses. With the exception of a few brilliant dashes, their services were solely those of dispatch boats, and for scouting and other duties which took them upon the high

seas and called for extended cruising. Practically all the work for which the unprotected cruisers had formerly been intended devolved upon these frail craft, until their sphere of operations assumed such proportions that the necessity of greater displacement and better sea-keeping qualities became imperative.

Compared with the torpedo-boats used by our navy in the war with Spain, the present-day destroyers loom as big as ocean liners. Instead of flimsy "boats" of one hundred tons we now have swift one-thousand-ton sea-going "ships." Long and narrow—abnormally long in proportion to their beam—with a high-built forecastle to take the heavy seas when steaming at full speed, and squat, slanting funnels, they look every bit the slinking, lurking "sea dogs of war." At twenty-five knots' speed they can creep along, silently and without causing smoke or wave, while their radius of action is such that they can cover over three thousand miles without having to refuel, and, in case of need, they can speed one-fourth that distance in forty hours.

Tactically, destroyers are employed in groups to attack the enemy's battleships at night. At full speed they sally forth, in wedge-shaped formation, until, at intervals of half a mile from one another, they scour the seas in search of their quarry. Anxious eyes scan the horizon for a

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LAUNCHING A TORPEDO FROM A DESTROYER

glimpse of the tell-tale periscopes of the enemy's submarines, should they be venturing from the protection of their own fleet. The far-flung fan-tail screen has then a double rôle to play—that of attacker and that of defender—since it best can clear the area about its own fleet of an enemy's torpedo flotilla and protect it from attack under cover of mist or dark by this most dreaded of all forms of naval warfare. Still on they rush, tearing through the water at a speed of fifty feet a second. The enemy's fleet has loomed up out of the obscuring mist. The destroyers fling themselves upon the surprised battleships. Bows on, they approach, rushing into the blinding rays of the enemy's searchlights, yet displaying so thin a black wedge to the enemy's gunners, and coming on so rapidly, that their danger of getting hit, even by a chance shot, is small indeed. Suddenly they throw their helms hard over, fire their torpedoes as they turn, and then dash off, disappearing into the murky haze as quickly as, a moment before, they had emerged from it.[4]

The destroyer, like the noxious vapor from a poisonous swamp, is the terror of the night air,

[4] Used with wisdom the torpedo-boat becomes a most powerful weapon; but used without practical knowledge of torpedo-boat warfare, the torpedo-boat becomes useless for offensive operations, and a weakness and hindrance to their own flag, as instanced by the Spanish destroyers during the Spanish-American War.

As the sun drops into the sea, and while the moon is yet beneath the horizon, the battleships lose their air of unconquerable majesty and wish to shrink unseen into the gloom; to be lost from all eyes until the night has vanished and the sun again rears its head, or until the moon comes to dispel the shadows in which the destroyer is hiding, ever ready to issue forth, unseen, unheralded, and unwelcome, and rush down upon its blind prey.

But, if the fleet is plentifully supplied with destroyers, it may rest easy from thoughts such as these. Half its destroyers can then be scattered about as night watchmen to guard the big vessels against the hostile raids of the enemy's speed craft, while the others, released from leash, are launched forth to attack the hostile battleships and thus compel them to restrain their own destroyers for their own protection. And for this double service, four destroyers to one battleship is a proportion none too generous.

As at present constituted, the torpedo fleet of the United States navy is divided into various flotillas, of groups of five destroyers each, one flotilla being assigned to each of the Atlantic,[5]

[5] Accompanying the twenty-nine destroyers of the Atlantic Flotilla is a larger vessel, the *Dixie*, which shadows her smaller consorts as a hen does her brood of chickens. She is the tender for the destroyers. Her work is with the flotilla only, and as such she stands ready to render immediate help to any of the vessels

Asiatic, and Pacific Fleets. These forty destroyers are constantly maintained at sea, except when the regularly determined repair periods recall them to the navy yards. Even in the depths of winter must they be able to go rolling through the mountainous seas of the Atlantic or to weather the fierce typhoons of the Pacific, traveling from base to base, trying out battle formations, or testing some new device of economy in fuel consumption. They are always "on the go," always working close to the "top notch." Yet, hard and uncomfortable as the life on board these craft is, there is no service in the navy as popular as the torpedo service. The complicated manœuvres, many of them carried out on the

that may be in need of assistance. Between her decks are a machine shop, a pattern shop, and a foundry. In the machine shop alone are thirty-two machines, all independently electrically driven, and no repair work is too difficult to be attended to on board. As the destroyers' storerooms can contain only a limited amount of stores, the *Dixie* carries gasolene, lubricating oil, and fresh water for every one of them. Her Lillie quadruple-effect sea-water distilling plant can furnish one thousand gallons of fresh water an hour, her electric bake ovens have a capacity of five thousand pounds of bread in twenty-four hours, and her ice plant has a capacity of one ton of ice. Such provisions and supplies the *Dixie* delivers to the destroyers daily. The smaller vessels go alongside their "mother ship" to receive oil, fresh water, "air" for torpedoes, and for repair work. But other than this their movements are dependent only upon the orders of their commander-in-chief. The *Dixie,* therefore, occupies a most important position in the fleet. Her services are indispensable to the flotilla, yet her own work as tender is often supplemented by the many calls that are made upon her for laying mine-fields or for mere ordinary gunboat duty.

darkest nights, the quick dashes, the very uncertainty of it all, appeal to every officer and man, and afford an experience and training that later become invaluable.

Not only do the torpedo-boat and destroyer owe their existence to the invention of the torpedo, but certainly the latest of modern ships of war, the submarine, would never have been developed to its present status as one of the essential divisions of a nation's fighting force without its incentive. Yet the first efforts at submarine warfare seem to have been made long before the torpedo was invented. As early as 1190 a man is said to have constructed a leather diving boat,[6] and numerous suggestions were considered to enable men to sink below the surface of the water in order to bore holes through the sides of an enemy's ship. But none of these contrivances, when put to practical use, had any fighting value, and one after another they passed into history as nothing more than interesting freaks.

It remained for an American, Robert Fulton, to design the first really successful submarine. Some years before, during our Revolutionary War, David Bushnell had completed a vessel, the *Turtle,* fitted with a small hand-screw propeller and a detachable powder magazine, but he was

[6] R. A. Fletcher: *Warships and their Story,* p. 289.

Mine Laying

more anxious to find someone else to make the attack upon the British fleet riding at anchor in the offing, than to do it himself. Fulton, however, actually made several descents on the Seine, in France, in 1800, but when an attempt with purpose was later made at Brest, he failed to do any damage to the British ships there. Then came the American shoemaker Phillips, with his cigar-shaped boat. But, though successful on numerous occasions, the inventor descended once too often and no one dared continue his experiments. The years of peace which followed discouraged further progress. Then came the Civil War, and with it the attempts of the Confederates to break the blockade of Federal "Goliaths" that was strangling them, through the medium of "*Davids.*"[7] Their first attack, upon the *New Ironsides,* off Charleston, S. C., was so encouraging, that another vessel of the type was immediately ordered. But in five experiments the second boat sank five times, proving that the submarine features of this class were decidedly overdeveloped. Still nothing daunted, one more trial had to be made, and this time the attack was successful, and the *Housatonic* was torpedoed and sunk. But the second *David* also and all her crew perished.

The rapidity of the development of the sub-

[7] The name given by the Confederates to their submarine craft.

marine from a seeming impossibility to a familiar vessel, rapidly becoming, if not now, quite the equal of any other craft, must always remain acknowledged one of the remarkable achievements of the present generation, and this not only because of the accomplishment of the fact, but because this evolution has taken place almost without the knowledge of the general public, owing to the air of secrecy which national governments have preserved about their submarine equipments.

When the United States, in 1893, advertised for designs for submarines, three inventors responded to the invitation of the Navy Department, and of these John P. Holland was the successful bidder. His vessel, however, was never completed, as she was planned to do things no submarine can do. But a second model, the *Holland,* launched in 1898, though a trifle uncertain in its movements, like a baby learning to walk, lived up to expectations, and the government finally purchased it, and at the same time ordered seven more of the same type, but of greater size and power. These new submarines were to be of one hundred and twenty-two tons displacement, sixty-three feet long, and eleven feet in diameter. For surface propulsion, a 160-horsepower four-cylinder Otto gasolene engine was to be used, while for submarine propulsion

a 70-horsepower motor, fed by sixty storage battery cells, was to be installed. These were to give the vessels a speed of over eight knots when running on the surface, and seven knots, submerged, while the radii of action of the two propulsors were four hundred miles and twenty-one miles, respectively. The submerged control was by means of stern diving rudders, at first pneumatically operated, but later by hand. Their armament was one bow torpedo tube and five small Whitehead torpedoes.

Since that date, 1900, every new class of boat designed has marked an advance in hull construction and in propelling machinery. The *Adder* class was followed four years later by the *Cuttlefish* class of three boats known as the *B-1, B-2,* and *B-3,* somewhat larger and with greater speed and radius of action. These boats were so successful that further improvements were experimented with, with the result that a practically new design was perfected in the *Octopus,* which the government acquired in 1908. The boats built up to this time had had but one screw. The *Octopus* was equipped with two, revolved by powerful engines of a new design, which have since become the basis of the designs of motors installed in all our newer boats. In fact, the *Octopus* was the first strictly modern submarine ever built in this country. One by one the new

classes followed upon this now perfected design. The *D* class of three boats was accepted in 1909, three years later we had the two *E* boats, the *Skipjack* and the *Sturgeon*. In 1912 four more were acquired, *F-1* to *F-4*, and the *G*, *H*, and *K* classes are, before many months, to form part of the navy's submarine force.

This increase in size, power, and endurance of these submarines, together with the accumulated knowledge and confidence which has all this time been acquired by the officers and men in the handling of these sensitive and capricious craft, is rapidly winning for the submarine a confidence that a few years ago was shared by only a few. They can now cruise and manœuvre on the surface, change their depth of submergence with safety and rapidity, and readily manœuvre submerged. Their tanks, to which water is admitted when they are submerged, are constructed to withstand the pressure due to a depth of two hundred feet, and the boats are fitted with sufficient air pressure and pumps to fill and empty them quickly. Their motive power, on the surface, is the fuel oil engine, much safer and more efficient than the old type of gasolene engine, while under water they are propelled by electric motors driven by storage batteries.

In cruising in harbor or at sea, and making passage from one point to another, the modern

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A Submarine Group Manœuvring on the Surface

submarines are navigated with the same appliances, the same methods and by the same landmarks, as their surface consorts. When "steaming" submerged, with only the tops of their periscopes exposed, their "ways" are the same, except that all their bearings and observations are taken through the periscope; when totally submerged, their movements are not unlike those of other craft when shrouded in a dense fog. It is impossible to see more than a few feet through the waters of the sea, but the depth at which they are cruising is never in doubt, owing to the use of reliable pressure gauges, so that the distance of the vessels from the surface above is constantly known with great exactness.

Before making a submergence, the submarines have to go through the same operation of "clearing ship for action" as do the large ships of the fleet. It is a comparatively simple task. The upper decks are cleared of bridges, deck fittings, and life lines—all knocked down and sent below within eight minutes. Then, in a few seconds more, the vessels are completely sealed. The holes in the hulls are covered by doors with rubber fittings and made watertight by a turn of a lever. A moment later, water is admitted to the tanks in the hold to counterbalance the major part of the floating power of the vessels,

and then to the tanks forward or aft to level them. Gradually more and more water is admitted, until the floating power is reduced to from six hundred to a thousand pounds. Gauges record accurately the results of each stage. The submarines at this moment expose about ten feet of their periscopes and are ready to begin a submerged run. The motors are then started, and the resistance of the water, acting upon the horizontal rudders and the deck, forces the submarines below the surface. Any desired depth may be obtained by giving the proper inclination to the rudders. In fact, the control of submarines when running submerged is practically the same as the control of surface vessels when steaming on the surface.

Life in such craft, when under way, would seem about the most uncomfortable, suffocating, and dangerous one possible. The accommodations for the crews seem calculated for half the number on board. The living rooms are in entirely too close proximity to the whirring machinery; only a thin sheet of steel separates the men from the terrible torpedoes; the outside water is so close that one can almost feel its moisture. But if all these discomforts really existed and the life in these craft were as harrowing as has sometimes been pictured, how would it be possible to get men to volunteer for service on board them? It

is true that the bluejackets receive extra compensation when engaged on submarine service, but that little inducement, assuredly, would never suffice. One thing, however, is certain. Though the living quarters on board the submarines are cramped and none too lavish, it is only when actually cruising at sea that these craft have to be continuously inhabited by the crews. In port and at the navy yards, the regular tenders of each division, such as the *Ozark* and the *Tonopah* in the Atlantic, and the *Alert* and *Mohican* in the Pacific, are the real homes of the men, and furnish them with comfortable sleeping and eating quarters. And then submarines are not nearly so mysterious or dangerous as some would have us think. Fatal disasters have, it is true, occurred with lamentable frequency in the navies of foreign powers, but the United States navy, fortunately, has never yet had such accidents to account for. This is not because our service has not been liable to similar casualties, or because our submarines have escaped only through blind luck; but because of the excellence of the construction and design of our models, and the precautions taken beforehand against dangers, by the Navy Department and by every officer and man on board.

In view of what our submarine flotillas have already done in practice during times of peace

there is little doubt that, should a war arise, they would be able to prove their fighting value. They possess every military characteristic essential to the modern ship-of-war—sea-going and sea-keeping qualities, invulnerability, and a powerful and destructive armament. Their mobility is shown by the distances covered by one division during an eight months' absence from the navy yards—25,000 miles on the surface and 3,800 submerged. One continuous run of 190 miles, in less than sixty hours, was actually made, the boats making but two stops on the way. And all this time the submarines were separated from their tenders and self-sustaining in every respect.[8]

The work of the submarine flotillas of our navy, is, then, one on which the boats and their crews are actively engaged from one end of the year to the other. Cruises, manœuvres, and target-practices occupy every moment of the time of the eleven submarines of the Atlantic Fleet, of the four in the Pacific Ocean, and of the six at Manila, P. I. One after another the ports along the coasts of their respective stations are navigated on the surface and in submerged condition, to the astonishment of the native sailormen. Often thick or heavy weather is met, but fogs,

[8] Yet it must not be forgotten that, though so well perfected, the modern submarine has thus far been tested under peace conditions only, and still has to score its first success in battle.

gales, and snowstorms have been time and again successfully weathered. All this has added to the confidence of the officers and men in the reliability of the weapons placed in their hands, and it is this feeling that, above all else, has contributed to records similar to the one made by the *E-1* last Fall, when, while running twelve feet under the surface and at full speed, she made two center hits in a ten-foot moving target at a range of three thousand yards.

What permanent and definite changes these serviceable media of naval warfare will, in the future, make in pelagic conflicts, remains to be seen. That they possess merit is incontestable. Their influence is one that is bound to be felt, for their presence must materially determine the movements and disposition of an enemy's battle fleet. But will the destroyer and the submarine, even with the aid of so powerful a destructive agency as the torpedo, ever be able to displace the battleship from her proud position of Queen of the Fleet?

GUNNERY TRAINING

The records of the past teach us that for the proper conduct of war there must be an objective and a plan. There may be several minor objectives, and a plan may embrace more than a single operation, but everything must become subservient to the prospect of attaining the main objective. The same conditions attach to the preparation of a nation's fighting force for war, and the proper training of its personnel in times of peace for the decisive conflict that may at any moment arise. The main objective of that training must be efficiency in war—efficiency in exactly such essentials as spell victory.

This preparedness should constantly dominate the military art. But, unfortunately, the objective of that preparation is generally the most difficult to keep in mind. The further we move away from the actual experience of war, the more difficult it is to keep the essentials in sight. After years of peace, the systems of naval and military training tend to become more and more based upon the theorizing of tacticians. Then war breaks out, and the defeated nation is brought face to face with the tremendous losses it has

A Gun Crew at Loading Drill

suffered through indifference to the fundamental teachings of forgotten struggles. Yet how often has the knowledge thus acquired from actual experience been blindly, if not deliberately, ignored. The British Navy, with all the lessons of Copenhagen, the Nile, and Trafalgar fresh in mind, found itself at loss to account for the victories of the American cruisers in 1812, the true causes of which lay solely in its own lack of discipline, ignorance of gunnery, and the general demoralization of its seamen produced by uniform success. But was the lesson remembered? A decade of peace, and the British navy had allowed its system of training to become as unreal as in the period immediately following the Napoleonic wars. Today the service has again come into its own, thanks to the mailed fist that was shaken at it across the North Sea, but before that date, only a little over a generation ago, as in 1812, the true end had again been lost sight of, and smartness at sail drill was the only thing sought after in a fleet of ironclads, to which masts and sails were a useless encumbrance. The *raison d'être* of the ship-of-war had been forgotten.

"In preparing a ship, and disciplining her crew for service, the fitness of her battery, skillfulness of her crew in its use, and the preservation of her military stores, should be regarded as among the objects of paramount importance; for she

may in other respects be well provided, be clean, neatly rigged, and have an active crew, but if her battery be imperfect in its construction, condition or appointments, or if, through carelessness, or want of a proper estimate of its importance, the instruction and exercise be neglected, so that her gunnery is bad, she will most imperfectly fulfill, in action, the chief purpose for which she is to be employed.'"[1] The measure of battle efficiency of the ship-of-war is her ability to deliver the greatest number of hits in the shortest possible time after an enemy is sighted, and this with the least expenditure of ammunition. Her crews may have to be trained to perform various drills, their pride as sailors may require that they be expert in seamanship, the conditions of life on board ship may demand that the decks be holystoned and all bright-work polished, but if this training and the many duties of the daily routine are indulged in to excess, and their performance not properly subordinated to the true end—of preparing the ship for battle—then all the work will have been in vain.

Early in its career the American navy, thanks to the active service required of it in the Revolutionary, French, and Tripolitan wars, was brought to the realization that the gun was the decisive

[1] Simpson: *A Treatise on Ordnance and Naval Gunnery*, 1859, p. 15.

weapon in naval battles. Exercising the guns and clearing the ship for action became the favorite pastime of the Yankee bluejacket, until the War of 1812 found him on such intimate terms with his thirty-two-pounders that the English despaired of ever knowing to what his "superior mode of firing" was due. But in the years of inaction which followed the historic naval engagements of that war, the service forgot the very lessons it had inflicted upon its powerful rival. "Frippery and gimcrack" were carried on to a shameful extent, and gunnery came to be overlooked more and more, until the Civil War found our sailors as little prepared for real action as the *Guerrière's* had been on the day they met the *Constitution.*

The present-day revival of gunnery in the American navy, however, dates from more recent times. The first opportunity afforded our gunners of demonstrating their marksmanship with modern high-power rifled guns was sixteen years ago. Up to that time, the conditions were such that but little incentive was offered the service to become trained as it should have been for the battles it was suddenly called upon to fight. But, fortunately for us, the enemy we met was not only ill-equipped, but inefficient, and the storm of shot and shell that burst upon the unhappy crews of Montojo and Cervera completed their

demoralization. Yet, in spite of these overwhelming victories, our gunnery had been poor, very poor. Out of the total number of projectiles fired at the Spanish squadron at Santiago, at what today would be considered point-blank range, not more than three and a half per cent touched the enemy's vessels. The real test of the ability of our gunners to hit a target under all conditions had been a keen disappointment. Something was wrong; immediate improvement was imperative.

Owing to the conservatism of those in authority, it was some years before the existing conditions were remedied. The moment the change came, the rejuvenation of American naval gunnery began. Thanks to the inventive genius of an officer of the British navy, that service had, some years before, surprised the world with remarkable records—percentage of hits of 80 per cent by the vessel under his command, when the average for the fleet was only 28 per cent[2]—and we, in our turn, were able to take advantage of this movement of reform and adopt the new system on board our own ships. This was in 1902. With this beginning in scientific gunnery

[2] What this improvement really meant was, that that officer, in raising the percentages of his vessel's gunnery from 28 per cent to 80 per cent, had more than trebled the value of his ship in action, and that he might be said to have added two large cruisers to the British fleet at no cost.

training came an era of intelligent and enthusiastic application of principles never before possible, and it is due to this, and to the energy and zeal with which the new methods of training have been studied and developed, that the United States navy of today, in hard, quick hitting, is second to none.

How has this been accomplished? By arming our ships with the best weapons and fitting them with the best and most modern ordnance equipment, by diligent drill and constant training, by the proper development of the battery and turret-divisions, each a basic unit of the ship's organization, and by an appreciation of the truth of the maxim that no ship can profitably engage in target-practice or even fire a few rounds until her individual gun-crews have been trained to a high degree of efficiency and every man of them, from the turret-captain down to the youngest member of the handling-room ammunition-crew, can perform his small share of the work with clock-like precision. Until this is so, the ship is not ready to fire a single shot; and this elementary training requires money, labor, and time.

A sailor's preparation for battle begins the moment he comes aboard ship. Within half an hour of his arrival, he has been assigned a station at a gun, with an older man to instruct him in his duties. Then his training commences. The new

recruit is carefully observed by each of his immediate superiors. He is studied both as to his mental and physical fitness for the various stations of pointer, trainer, sight-setter, plugman, loader, shellman, and powderman,[3] and then he is tried out at the duty for which he seems best fitted. If he gives promise of being able to do well the thing for which he has been selected, more thorough detailed instructions follow the preliminary drills. He is taught each element of his duty, and required to perform each operation over and over again. Even the smallest details are most carefully impressed upon him, for, in the practicing of these little matters, which he would otherwise be likely to consider of no consequence, he is taught to avoid the mistakes of others schooled by actual experience. Thus far every motion has been executed deliberately and with care. But the moment the officer is satisfied that his man has acquired accuracy and confidence, there begins a process aiming at a systematic increase in the speed of each operation,

[3] The pointer and trainer are the members of the gun-crew who aim, elevate, depress, and train the gun, and the pointer, in addition, fires the piece at the given signal; the sight-setter keeps the lateral and elevation sights of the gun accurately and exactly as he is ordered; the plugman opens and closes the breech-plug, inserts the primer, and cocks the firing lock; the loaders ram home the shell and powder-bags after they have been placed on the loading tray; the shellman and powderman handle, respectively, the projectiles and powder-bags and place them upon the loading tray.

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A Seven-Inch Gun Crew in Action

since intelligent rapidity at drill is essential to an intelligent rapidity that, in battle, must be mechanical.

Then comes the next stage in the training. No sooner has each member of the gun-crew been developed in the performance of his individual duties as pointer, sight-setter, plugman, or loader, than the several individual units are fitted into a homogeneous crew. Each man is shown just where his own duties dovetail those of the other members of the crew. This team-work is carried on slowly at first, to develop co-operation and overcome every tendency of interference, and teach each man to fit into his proper place naturally, almost mechanically. Every useless movement is eliminated, and every physical feature of gun, mount, ammunition hoist, and sight is carefully studied, until perfection has been attained.

How much of this perfection has been due to the navy's use of the "dummy loader" invented in 1903, only the service itself can fully appreciate. Formerly loading-drills had to be classed among the most expensive of a navy's pastimes. Few guns could survive many years of such hard usage, and their breech-blocks were soon worn by the constant slamming and denting of the quickly thrown shells. But a marked economic improvement resulted from this timely invention in the

saving of the life of the costly guns. The new device was a facsimile of the breech and powder-chamber of the piece, to the point where the rifling begins. Loading it required motions identical to those employed in loading and firing the real weapons, and the same shells and powder-bags (dummy ones, of course, filled with sand) were used. The shellman had to have the same strength and dexterity; the primerman had to be quick and accurate; the plugman needed the same cat-like spring to "man the plug" properly. In no time the men themselves became enthusiastic over the "sport." They quickly became expert in lifting, handling, and loading the heavy shells, and developed record times for elements of gun service and operation that were truly little short of marvelous. In a trifle over two seconds the heavy breech plug is now swung open and to one side; in three and two-fifths seconds the steel projectile, weighing 870 pounds, is firmly "seated," and in less than five seconds more the four-bag powder-charge is rammed home. Then half a second follows before the loading-tray can be removed; another two and four-fifths seconds elapse while the breech plug is being locked, and the primer inserted—all this in less than a fourth of a minute.

To the crack gun-crews of 1861 such records would have seemed incredible. No IX-inch

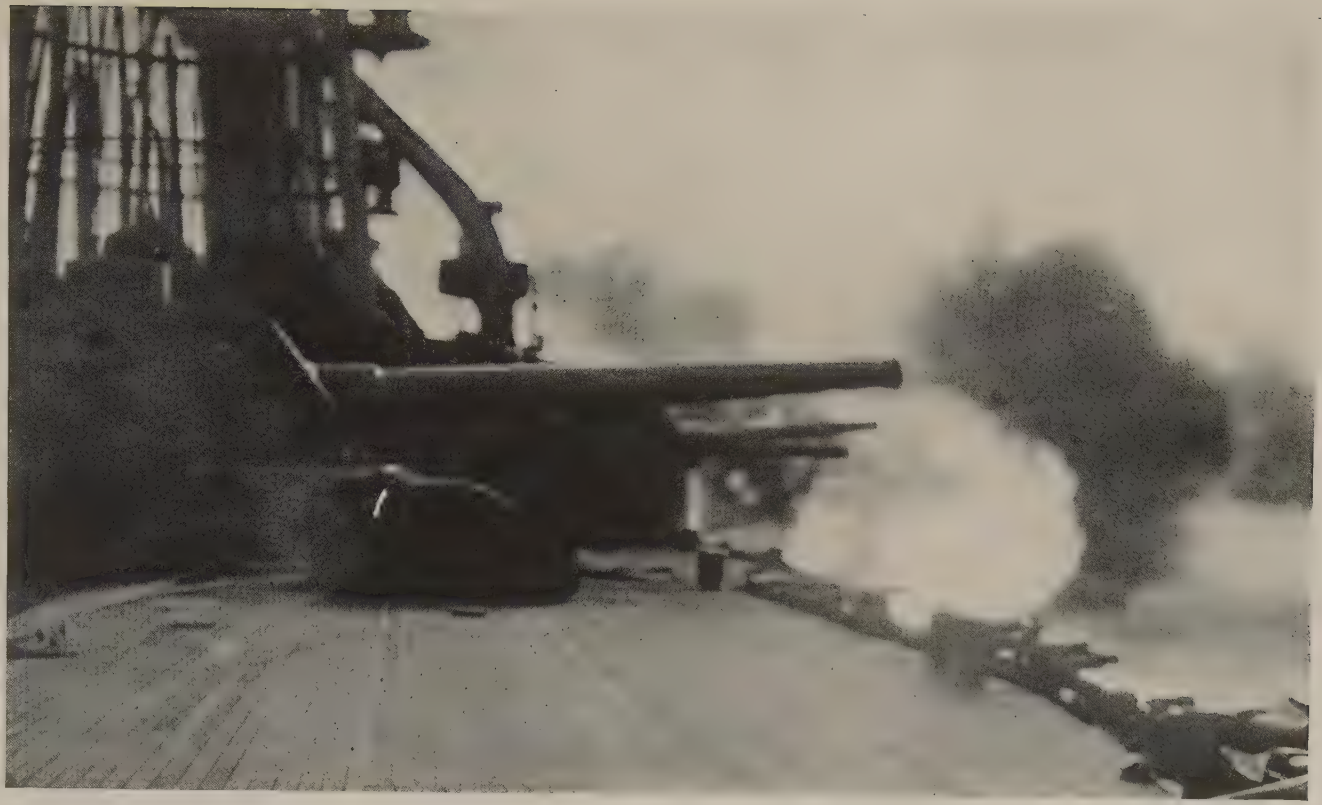
smooth-bore of that day could have been handled so rapidly. Even as late as 1886 the time in which that weapon, weighing nine thousand pounds and firing a 72-pound shell, could be served from fire to fire was carefully noted as not less than one minute and twenty seconds, while the best record made up to that time by a picked gun-crew was forty-three seconds between fires—a record that was, however, discouraged as dangerous to both gun and crew. But the IX-inch smooth-bore and the other weapons in use in our navy up to the Civil War, and even into the days of the Spanish-American War, bore little resemblance to the guns with which we are today arming our Dreadnoughts and Super-dreadnoughts. They resembled more the cannon with which Philip of Spain crowded the gun-ports of his galleons in the days of Drake and Howard, and, except for the improvements made in sights and gunpowder, the Yankee tar of the nineteenth century had, after all, but little over the red-turbaned buccaneer of the Spanish Main. The American bluejacket's reliance in 1861, as in 1812, was the nine-foot-long 32-pounder,—weighing 54 cwts., and firing a 332-pound iron ball with an 11-pound brown powder charge, having an extreme range of 2,200 yards, with, however, no possibility of accuracy,[4]—the long

[4] Compare this with the beautiful, practically perfect, twelve-

gun which the *Constitution* and the *United States,* the *Wasp* and the *Hornet,* had used with such telling effect. Every four minutes, the log-book of the *Constitution* tells us, *Old Ironsides* could fire her broadsides, and fire them with clock-work regularity. Deliberate firing, we would call it, but hardly deliberate it would seem, when we consider the guns and the carriages on which the pieces were mounted, or the manner in which both had to be handled. Even in 1861 these guns were mounted on heavy, clumsy wooden carriages such as crowded the gun-decks of the *Victory* at Trafalgar, carriages on wheels, pulled this way and that by ordinary tackles, and trained with handspikes and elevated and depressed by means of a wooden triangle, called a "quoin," shoved in under the breech to keep the gun at the desired angle.

Nor would such records as today are made have been possible with the 13-inch breech-loaders with which the *Oregon* and the *Indiana* were armed in 1898. For it is only within a decade that naval ordnance has emerged from the experimental, transitional stage that followed the introduction of modern weapons on board modern

inch steel breech-loading rifle of 1913, weighing fifty-six tons and fifty feet in length (the *Hornet* of 1812 was only 106 feet long), capable of firing an 870-pound steel projectile with a 340-pound charge of smokeless powder, and with accuracy, at an extreme range of 24,900 yards.



The Battleship Kansas's Broadside

ships-of-war. Every feature of the mechanism of those days placed a limit upon the speed with which the pieces could be worked. "Groaning, lurching complications" discouraged the officers and the men at every turn. The gun-sights were inaccurate and never intended for long-range firing, and were besides improperly made; the elevating and training gear on the gun-mounts was poor, and the breech-blocks jammed all too easily. But the spirit of 1812, the true fighting spirit of the navy, was still there. Willing workers took up the task of remedying the defects, and it is thanks to their unselfish labors, and to the splendid co-operation of their men, "the men behind the guns," that the goal has at last been reached.

It must not be supposed, however, that good gunnery has been realized through rapid loading alone. Team-work and the quick handling of the shells and powder-bags are essential factors of success, but they are still only half the work of that human machinery which Admiral Erben christened "the man behind the gun." The skill of the pointer, who presses the firing key and releases the 870-pound missiles also had to be developed to secure the well-directed fire which Admiral Farragut once said was not only essential to ultimate victory, but also very necessary as a protection against an enemy's gun-fire.

The method of training which has brought this about came to us from the British Navy, and consists of an ingenious mechanical device, whereby a small target is made to move across the face of the gun, simulating the relative motion of a ship under way. This target the gun-pointer, sighting his piece through the regular telescope-sight, must follow with his gun, and fire at, by pressing his firing key, whenever the cross-wires of his sight (the lens of the telescope has a vertical and a horizontal line across it) are on the bull's-eye. A small card, pierced by an electrically operated needle every time the gun is "fired," registers the accuracy of the pointer's aim, and shows him whether he was "on" or not.[5]

In this there has been a radical departure from the system we inherited from the days of sails and smooth-bore guns, the invariable rule of firing at the top of the downward roll, and the only rule known to navy men of that day. The native ability of the gunner then was the chief asset of the service in target-practice and in action. Telescopic sights, adjustable range and deflection sights on the guns, fire-control, and all the other refinements that are now so essential

[5] It is interesting to note that the British Navy had such a device in use on board its ships in the early sixties, and that their system was shortly after introduced into the French Navy. (Lewal: *Artillerie Navale,* 1863, Vol. II, pp. 1-3.)

On Top of an Eight-Inch Turret during "Dotter" Practice

to hitting the mark, were then unknown quantities. The gunner sighted his piece by glancing along the top of the gun, parallel to the center of the bore—allowance being made, of course, for the inclination of that line to the axis of the bore due to the metal being thicker at the breech than at the muzzle, by the line of metal, as it was called—and fired at his own discretion. As the ship hovered on the top roll of the sea, with her guns pointing skyward just over the enemy's royals, he would make a rapid mental calculation. As the ship began the downward roll, he would set himself for the proper moment and, the instant he thought his gun bore on the target, pull the lanyard, and then trust to the grace of Neptune and his lucky buttons.

But better ordnance made possible better methods of training, until the "dotter" supplanted them all and initiated the gun-pointer in the secret of "continuous-aim firing"—the art of keeping a gun trained on the target, regardless of the oscillations of the vessel, during the whole or a portion of the roll. It is this ingenious device that has revolutionized the gunnery of our navy, and made possible the remarkable target-practice records of our fighting ships. And what is more, it has brought about a system of training that does not cost the country one cent for ammunition.

The gun-pointer, whose one ambition in life is to fire his gun six months later when target-practice begins in earnest, has taken to the "dotter" like a duck to water. It has given him a new interest, a new incentive, in his work. Whereas formerly he had no opportunity of getting himself in training for the "big game," now he has the "dotter" at his service for the asking. During drill hours and out of hours he can and does practice his hand, eye, and nerve. With his eye glued to the rubber flap of the telescope and his hand on the steering wheel and firing key, he fastens his gaze on the black speck of the bull's eye like a hawk. If he makes a mistake of a fraction of an inch the needle is sure to wander out of the bull's-eye, and registers a miss that in actual practice would mean yards off the target. The elusive mark must be kept in front of the waiting needle for minutes at a time, and, to secure this perfect co-ordination of brain and brawn, the tireless practice of an enthusiast is requisite.

From a drudgery, gunnery has developed into a game of contest. Every pointer, every gun, every ship, and every squadron has been placed upon a competitive basis. Consequently, a spirit of rivalry has sprung up that, from the first, was bound to have most beneficial results in what is without question the most spectacular of contests.

And to the men, it is not only a matter of pride and glory, but a question of increased pay. Prizes are offered by the Navy Department for the high scores with turret and broadside guns of each caliber. All the members of the crews to which prizes are awarded get a money prize amounting to from five to twenty dollars each, while each gun-pointer making a qualifying score is assured an increase of from two to ten dollars in his monthly pay. The winning crews, if their scores warrant it, then have the right to paint the navy "E," meaning excellent, on their turrets and gun-shields, and every man of the crew is furnished by the Department with a small letter "E" to be worn on his sleeve for a year. What an incentive these rewards should be, and are, can be appreciated. But they are not the only thing sought after. The honor of the ship stands out pre-eminently as the one thought in every officer's and man's mind while the competition is going on, and the honor of carrying the trophy of her class remains more eagerly contested for than all the money prizes put together.

It is this phase of the navy's work, then, this training in gunnery, that year in and year out occupies the attention of every one in the service from the highest in rank to the lowest in rate. Our record is still young in years, but our system has been so modified from the one we received

from the British Navy, that in the past decade we may be said to have developed a system wholly our own. Perfection has not yet, by any means, been attained, but our personnel has been trained in resourcefulness and initiative until, year by year, the weak points in our methods are being eliminated and the good ones strengthened. It is our team-work, team-work inspired by competition, that has borne fruit, and it is this splendid co-operation between the commissioned officer and the enlisted man that will, when the crucial test of battle comes, produce more hits-per-gun-per-minute than any other conceivable factor.

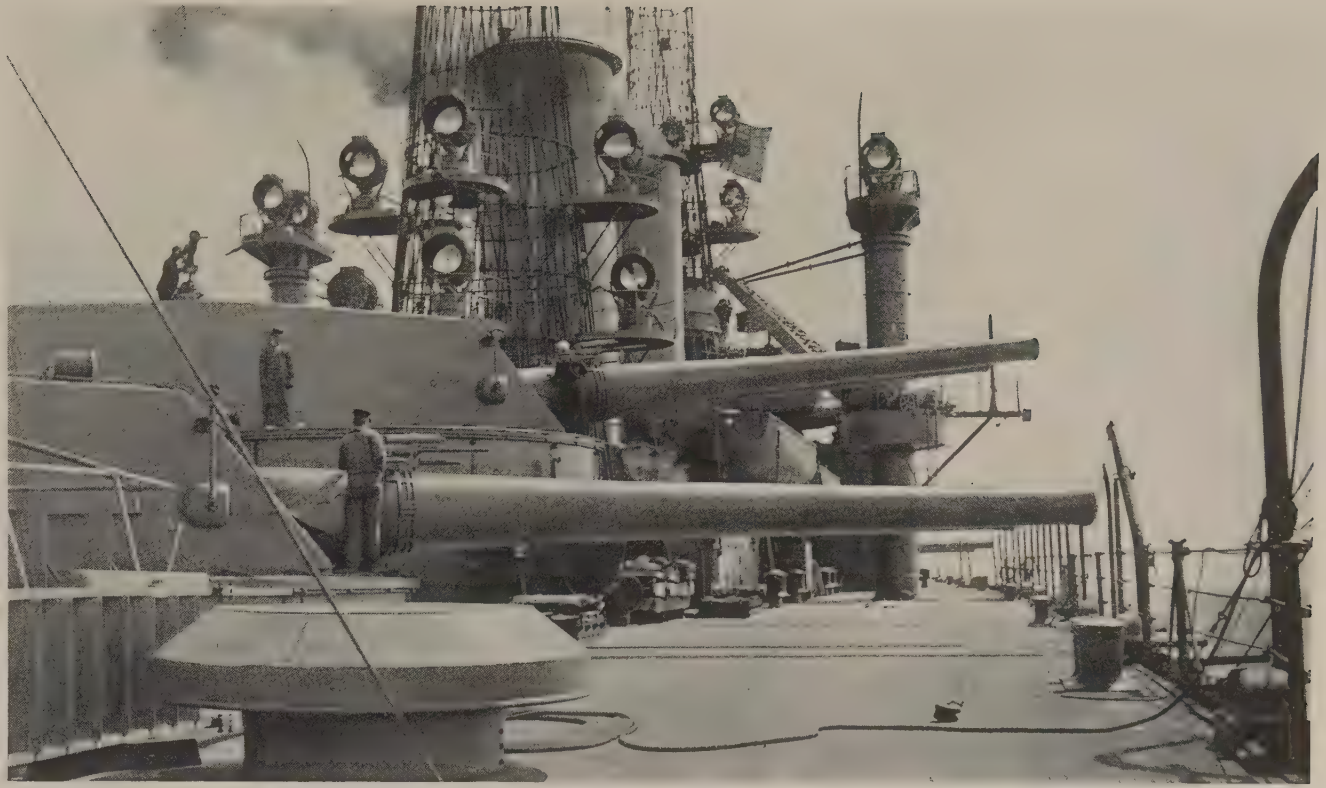
TARGET-PRACTICE

It is indeed fortunate, in this age of great naval armaments and extensive warlike preparations, that the training of our fleets and squadrons should be based upon a principle often proved to be sound—that the greatest asset a naval force can possess is an effective and accurate gun-fire. For, since the beginning, notwithstanding the influences that the ram, the torpedo, and the submarine have at times had upon marine operations, the strength of a navy has ever been in its shooting—or rather in its hitting—and, in so far as that has been good, fair, or bad, so has the navy concerned been strong, mediocre, or weak. Ships have always counted for much—without ships no guns could have been mounted afloat—and men have counted for more; but what, in battle, has counted the most, has been what those men got out of the guns that were mounted in the ships they manned. And that is the only thing that really mattered.

Because of the crudeness of ordnance, excellence in naval gunnery in years gone by would seem to have consisted more in comparative rapidity of fire than in actual accuracy. The old smooth-bore cannon of John Paul Jones's day

were so weak that the ranges at which battles were fought were necessarily very short. It was a question of yardarm to yardarm, hard pounding at close quarters, when ships fired broadsides into each other at point-blank range, "so close," as the great Nelson himself remarked, "that our shot cannot miss the object." And in this fighting of broadside to broadside, the capability of getting in two shots to the enemy's one, was the factor that determined the victory.

Target-practice in those days, therefore, came to be looked upon more as a test of the agility of the gun-crews in ramming home the powder and ball charges, than as a trial of the accuracy in sighting of the gun-captains, who almost invariably reserved the right of pulling the lanyards of their own guns. If this was not the case in our navy during the War of 1812, it, at any rate, became the custom in the years of peace that followed the Treaty of Ghent, when the sole employment of our frigates and sloops was chasing pirates and slavers and cruising from port to port to display the flag abroad. Great-gun exercises and target-practice, from realistic drills held under conditions as nearly like battle as possible, degenerated into mere shams. The gun-crews manned their tackles and swung their handspikes and ran their guns in and out of the gun-ports, until they, and not infrequently their



Deck Scene on the Flagship Wyoming during Sub-caliber Target Practice

officers also, felt that they had done everything necessary to ensure victory. But when the guns were loaded and run out, and the broadside trained upon the target, so many precious moments were wasted while the orders were given, slowly and deliberately, to "Handle your match and lockstring," "Cock your lock," "Blow your match," "Stand by—Fire," that by the time the various details of the "manual" had been strictly complied with, not a gun bore upon its mark.

The introduction of the rifled gun, about the time of the Civil War, and of the breech-loader some years later, completely revolutionized these revered traditions of naval gunnery. Long-range firing now developed into a contest of skill in which real accuracy became possible[1] and one in which hitting the mark was no longer merely a matter of chance. At that moment, the modernization of naval ordnance began. It is true that the full realization of this improvement did not come until the closing years of the last century, and that practical results were not obtained until several years later. But a beginning had been made, and that, considering the centuries which had elapsed without material progress, was a

[1] Because, since the shot no longer had to be rammed in from the muzzle, a closer fit of the projectile in the bore of the gun became possible.

great deal. The perfection of breech-loading weapons was gradually accomplished, until today we have such remarkable, finely adjusted mechanisms that the old "Long Tom" seems a crude toy compared with the twelve-inch rifle carried by our modern battleship. And then there has been the development of the telescopic sight, an American invention, and the perfection of various systems of fire-control,[2] without either of which accurate shooting, at the excessive ranges today practiced, would be well-nigh impossible.

But after all, it is what the men behind the guns get out of those guns that counts the most. This we realized in 1812, and appreciated again in 1861. But in the period that followed the close of the Civil War, the lessons of those years of active service were quickly forgotten. No sooner had the last shot been fired than the whole country seemed to lose all interest in the navy which had become the greatest among the fleets of the world. The powerful effect of the blockade in throttling the supplies of the South and thus reducing the Confederacy to inanition was not yet understood by the great majority of our people. A number of officers, fortunately, remained alive to the needs of the service during

[2] The art of transmitting the correct ranges from the fire-control party in the tops observing the fall of the projectiles to the guns in the turrets below.

that period of retrogression and urged them time and again, until the birth of the White Squadron furnished the popular incentive for the reconstruction of our fleets and made possible a revival of interest in naval gunnery. With better ships and better weapons placed at its disposal by Congress, the navy once more took heart. Even then, the difficulties to be overcome were many. The time-honored traditions of the days of sailing ships and ships of wood could not be adapted in a day to a steam and steel fleet. Everything had to be changed, and readjusted to the new conditions. Then came the war with Spain, and the discovery that, though the gunnery of the few vessels then composing our battle-fleet was probably not inferior to that of any other navy of that period, our shooting had not been as wonderful as our overwhelming and decisive victories had led us to believe. This disappointing realization, however, had most beneficial results. In a few years, the entire system of gunnery practice in our navy was practically revolutionized. Hitting the mark became the chief aim of our officers and bluejackets, instead of being merely a secondary feature of their work. A special office of Inspector of Target-Practice was, in 1901, established to supervise this important phase of the navy's work. Earnest efforts were made to ascertain the reasons

for our failures and to remedy the existing defects in materiel and in the development of the personnel. Mistakes were made, some of them costly, but the experience gained was never forgotten, and the causes of error, once discovered, were immediately removed.

Whereas in 1896 a shot every five minutes from a turret-gun and one shot a minute from a six-inch gun were considered satisfactory performances, fifteen years later two shots a minute could be fired with regularity from the twelve-inch guns, and eights shots in the same period from those of six inches in caliber, and this rapidity of fire was obtained without any loss in accuracy. In fact, the records show that the navy's percentage of hits in that time actually improved from three and one-half per cent in 1898 to about twenty per cent in 1911, while the ranges at which the practices were held had correspondingly increased from 3,000 yards to 11,000 yards. All relics of the old system were gradually abandoned. The small triangular sail, the "bull's-eye" of an imaginary target 100 feet by 25 feet, which formed the basis of our navy's smooth-water target-practices until the true navy spirit reasserted itself in 1902, was consigned to the scrap heap, and, instead, full-sized target-screens, to be hit and not merely fired at, came into vogue. Little by little target-practice was

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A Salvo of Twelve-Inch Shells Landing. A View of Big Gun-Practice from the Ship Towing the Target Raft

developed as an art and a science. As each successive step was met, new suggestions were made and carried out, until in 1909 the battle-fleet formally adopted long-range firing at moving targets. And all this was accomplished during the past few years because the Navy Department in Washington sought the true solution of the great problem and trained the men of the service in the right way really to use the guns with which our ships had been armed.

One phase of this gunnery training we have already followed, that phase which develops the eye of the gun-pointer, the acute hearing and power of mental concentration of the sight-setter, the strength and dexterity of the shellman, and the agility of the plugman. But, valuable as this system is, it is only one phase of the training. It teaches the gun-crews only how to "man their tackles, swing their handspikes, run their guns in and out of the gun-ports, and train their broadside upon the target." Each man as a unit and each crew as a team have been trained so that each element has become a perfect-fitting cog in the great gear train, and each part has been carefully adjusted and oiled. But that great, complicated machinery has not yet been set in motion. Not a shot has been fired. Practice under actual service conditions is the test that still has to be met, the practice in which the

efforts of every officer and every man, from the admiral on the bridge down to the coal passer in the fire-room and the bluejacket in the ammunition handling-room, are concentrated to attain the ultimate purpose—battle efficiency.

In order to bring out this co-ordination of all the units with the least effort, our navy has established a series of practices, a kind of "course of study," in which each of the various stages is gradually mastered until the final practice of the year finds each ship primed for the fray. The setting is staged on the Southern Drill Ground, a patch of the ocean particularly free of traffic, off the Virginia Capes, within the area bounded by Latitudes 36° 45′ and 36° 55′ N., and Longitudes 75° 35′ and 75° 45′ W. Here the entire battle-fleet assembles each spring and fall, immediately following the winter and summer exercises in the Caribbean Sea and in Narragansett Bay respectively.

The first of these practices is Elementary Target-Practice, which, as its name implies, is a demonstration of the fundamentals of gunnery. Until a few years ago it was always held in smooth water and with anchored targets, but now the firing takes place in the open sea, at a range of about two thousand yards, with small targets just sufficiently large to catch well-aimed shots. All the guns have been properly calibrated (that

is, set to hit the spot aimed at at the same given range, the telescopic sight-line and the bore-sight-line converging to a point at that distance), the ballistic properties of the powder are known, and the ships steam across the range at set speeds, firing their guns individually at towed targets, whose speed and course are also known. Thus all the conditions are accurately known, except the personal equation of the man. It is to determine this, to test the value of the weeks of systematic, detailed training, that this practice is held. Only one gun is fired at a time, and each pointer fires at his own target. Accuracy and rapidity of fire are sought, but accuracy is desired above all, for to qualify as gun-pointer a very high percentage of hits is required. It is the one practice of the year in which the gun-crews, the gun-divisions, and the ships, are keenly pitted against one another. The guns of large caliber are fired in the daytime, while the smaller guns fire at night, under conditions similar to those they would encounter in repelling the attacks of torpedo craft.

That the competition in elementary practice may be equally fair and favorable to all the gun-pointers, and that the conditions of sea and weather, in so far as possible, shall be the same for all the ships, every effort is made to assemble all the vessels of each fleet which is to conduct

the firing. The practice of each ship is, therefore, held in the presence of all her consorts, the record of each gun-crew is intently watched by all the other crews in the fleet. The competition and interest thus aroused furnish an incentive never possible under the old régime.

Having trained the individual, developed the gun-crew, perfected the mechanism, and learned from the elementary practice what to expect under favorable conditions from the firing of the individual, the navy next enters upon the final stages of the training for battle efficiency. The forms of firing now become more and more advanced in character, the conditions are not the same for all the ships, and competition is sacrificed to realism. It is real Battle-Practice. The firing vessels have no knowledge of the course, speed, or distance of the moving target. The only known factor is that somewhere on the horizon at a distance of a dozen miles are columns of smoke which mark the enemy at which they are to shoot. At full speed, the firing ships steam toward their targets, and, when within range, open fire at whatever distance they choose, the minimum range, however, being strictly defined by the rules. The turret and main battery guns are fired together, two at the same instant in "salvos," and then all simultaneously. The whole practice is completed in four minutes,

precious moments indeed, for, if a ship fails to make a qualifying score, she has no other chance to make good.

Then comes Divisional Practice, the final step in the development of the fleet for action, and by far the most spectacular and most imposing phase of the whole work. The ships of each battleship division are formed in line of battle, making their approach and delivering their fire under actual battle conditions. No possible elements of realism are omitted. The silhouettes of the towing ship and its tow of targets, representing the battleship division of the enemy which the firing ships are to engage, are barely visible. But, at the signal from the admiral commanding the division, the ships let loose the full power of their tremendous broadsides, following every move of the flagship and simultaneously obeying her signals. The control of the division has at last been obtained so that all the guns can be used as a unit.

How even a single hit is registered at the excessive ranges of the battle practices of today is, to the landsman, inconceivable. Even the navy man of a decade ago would have thought it preposterous. But in that day the ordnance material now mounted on board our ships had not yet been developed, the "dotter" and the "loading machine" had only recently been

introduced, the telescopic sight had not been perfected, and the science of properly directing a vessel's fire was still in its infancy. Remove from our navy any of these assets, remove only the telescopic sight, and the range of the batteries of our Dreadnoughts would be reduced to one-fourth their present limit.

Twenty-three years ago there was no such thing as a telescopic sight. The guns of the world's navies were equipped with open bar sights—the one at the breech being adjustable to give proper elevation to the gun—which were no more accurate than those we had in the Civil War. The sights being mounted on the guns themselves precluded any possibility of accurate aim at the moment the piece was fired, owing to the violent recoil of both gun and gun-carriage. Then came the invention of the telescopic sight, and its practical test on board the gunboat *Yorktown,* in 1892. But its superiority over the old open bar sight was not, at the time, sufficiently appreciated by the service or by the Navy Department. Today, however, every gun in our navy is equipped with it. Instead of showing inexactly, it shows exactly, the object at which the guns are being aimed; it clears up the target wonderfully, besides enlarging the old field of vision some four or five times; it does not recoil with the gun, because it is attached to the mount

Divisional Target Practice

instead of to the piece itself, and the gun-pointer can, therefore, keep his eye constantly fixed to the eye-piece; and, lastly, used in combination with the admirable elevating and training mechanisms now employed—and thanks also to the "dotter" with which our gun-pointers are being trained—it enables both pointer and trainer to keep the cross-wires of the telescopes continuously upon the target.

But, while the introduction of the telescopic sight solved one important essential to accurate gunfiring, one of the greatest difficulties had yet to be surmounted, and that was the measurement of the range and a proper control of a ship's fire after the initial range had been established. It was an embarrassment that the seamen of the old navy sought vainly to overcome. In the early years of the nineteenth century, the ingenious expedient of utilizing a large pendulum hung in the main hatch was adopted to control a vessel's fire when she rolled in a seaway and the smoke of the discharge of her broadside obscured the enemy from view. Systems of signals were also devised to secure the proper angle of elevation for the lee guns or of depression necessary for those of the weather side. But our wooden navy of 1812 and our ironclad fleet of 1865 never, even with these ingenious innovations, obtained satisfactory results.

Today, on the other hand, we have an elaborate, highly scientific, system of fire-control. To the inventive genius of many do we owe the delicate instruments upon which the efficiency of the hitting power of our guns has become so dependent. For it must be remembered that, in the firing of naval guns at sea, accuracy is not dependent upon the expertness of the gun-pointer and sight-setter and loading-crew alone. There are other conditions which directly affect a vessel's gun-fire. There is the distance to the target, the temperature of the gun, the condition of the powder, the density of the atmosphere, the wind, and various other factors that directly affect the flight of the projectile. But, broadly speaking, it may be said that if the pointing and the sight-setting are accurately done and the range is definitely known, a bull's-eye will be scored.

It is evident, then, that the primary necessity is to know the range or distance. This our ships obtain through the co-operation of two important agencies—the range-finder and the spotter, the first of which determines the exact ranges and transmits them to the guns, while the latter, and the more nearly human of the two agencies, accurately estimates and quickly corrects the errors due to the conditions already mentioned.

As the surveyor measures a base line with his

steel tape, sets up his transit at the ends of this line, measures the angles, and then calculates the distance from the base line to the object, so does the range-finder do its work. Only it works out this mathematical problem automatically within its steel shell, and divulges only the result of its ingenious method of calculation—the distance—to the observer operating it. The length of the range-finder's base line depends upon the size of the instrument, and this, in some cases, is as much as twenty feet. At each end are object glasses, directed toward the distant vessel, while on the opposite side, at the center, are the eye-pieces for the observer. The image received through the left hand glass is seen by the observer in the lower half of the field of his eye-piece, while that coming through the right hand one is reflected in the upper half. These images represent, respectively, the lower and the upper halves of the vessel sighted. When the range-finder is out of setting, these two halves are not properly aligned, but by turning a small thumb screw, the observer can move a deflecting prism along the axis of the tube and thus more accurately superpose the images that have been focused by the glasses at the ends. The instant the alignment is secured, the observer glances at a small horizontal scale on which the exact distance is indicated, and this distance is commu-

nicated to the fire-control station below deck, where the necessary allowances for the speed of the enemy, his course, and the various other factors, are made, before the corrected range is telephoned to the sight-setters at the guns.

There is, perhaps, no other spot on the modern battleship where so much energy is crowded into the flying minutes, as this fire-control station. It is decks and decks below the conning tower and turrets, sheltered behind massive armor plates, and reached from above only by ladders perpendicular and ladders aslant. The doors and walls are padded; the room is practically sound-proof. Plotting boards, target-bearing instruments, range clocks, speaking tubes, telephone wires, switchboards, and other devices, for which the bluejacket has invented the all-descriptive term of "gadgets," fill the available spaces, while on every side are range indicators on which the thousands of yards pop up with amazing frequency. The fire-control force is seated about the room, some at the plotting table in the center, the others at their various stations. From every part of the ship comes news of the enemy, of his movements, of the range, and of the different happenings in the turrets and on the bridge. With the lessening range comes a tension that defies description. The orders fly thick and fast. There is a perceptible rocking of the ship

as the broadside is fired. The muffled roar of the salvos is heard over the telephone. Then come the corrections from the spotters in the tops, a few rapid calculations are made on the plotting board on the table, and then everything is ready for the next salvo. The fire-control station is truly the heart of the ship in action.

But the accuracy of the range-finder and the skill of the fire-control party in the sound-proof room below would avail little were it not for the "spotter" stationed in the top of the mast, one hundred and thirty-five feet above. His task is one that requires good, strong eyesight, calm, accurate judgment, and intense interest. For he must always be keenly alive, and make up his mind unhesitatingly as to where the shots fell, and give his corrections quickly for the next salvo. The tension under which he will have to work in battle, and under which he does work in target-practice, is enormous, and the duty is one for which he must receive daily training[3] in order that his eye and brain may work in perfect synchrony. With glasses glued to his eyes, he follows the falling shot. From the flash of the gun, he must be on the *qui vive*. Your watch ticks off the seconds of the salvo's time of flight—ten-eleven-twelve seconds. As the second hand

[3] For this daily training, without the expenditure of ammunition, a dotter of fire-control has been devised.

jumps to thirteen seconds, a group of fountains of white water leap up about the target. In that instant the spotter must judge just how far the shrieking shell struck "short," "over," or to the right or left of that distant mark, and it is this correction which, telephoned to the fire-control station below and then communicated to the sight-setters at the guns, enables the pointers to get *on,* and then stay *on.*

When the Dreadnoughts come on the range, however, all that personal element is hidden. The captain is in the conning tower, the pointers and trainers are behind the twelve-inch armor of the massive turrets, the gun-crews are at their battle stations, the spotters are concealed from view in the tops, and the fire-control party is in its little room down below the water line. Not a human being is about the decks. Rails and stanchions have been unshipped on the forecastle and quarterdeck, hatches battened down, ladders housed, and life lines rigged. All the boats are swung inboard and chocked up on the boat deck, while below cabin doors have been stowed away in the passages, pictures and electric fans laid flat on the bunks, and all china and glassware put away in some empty storeroom to lessen the chances of breakage when the guns are fired.

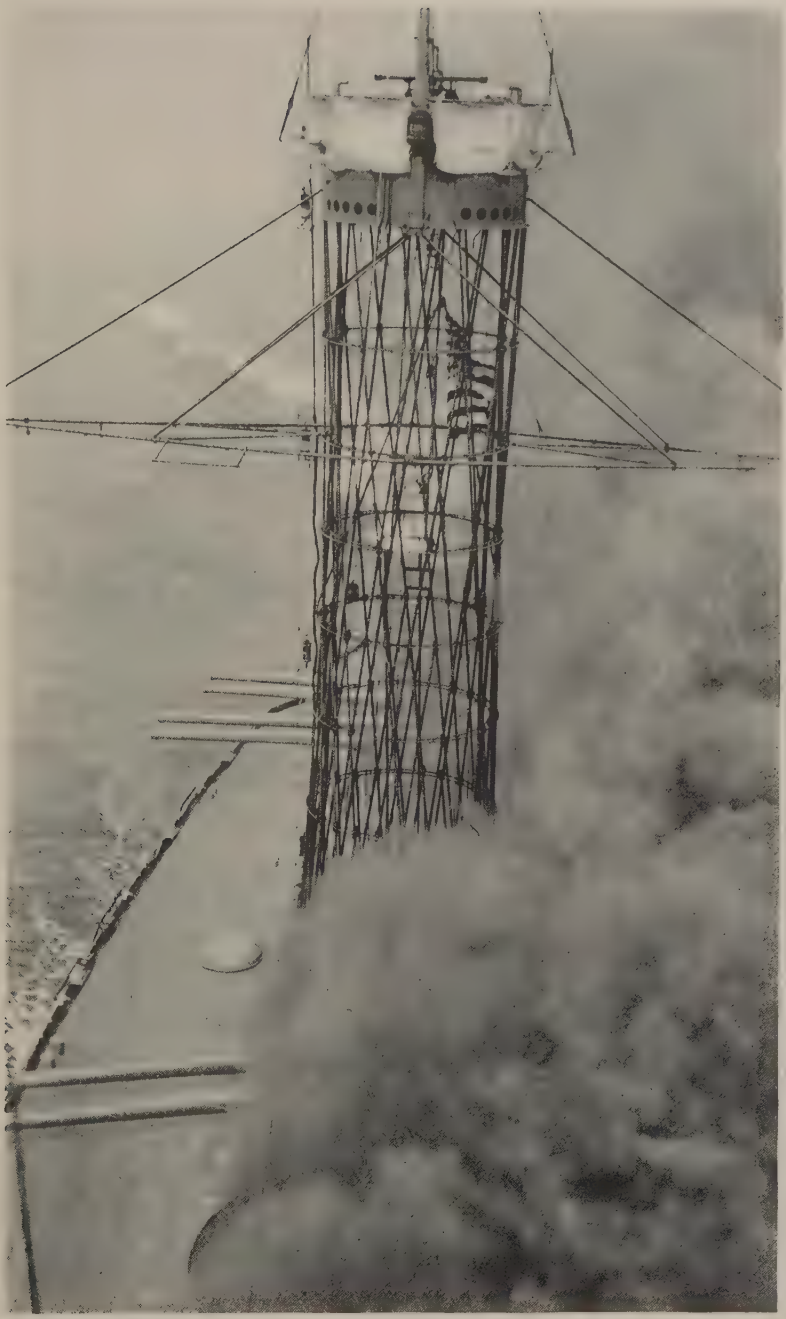
"Stand by!" The targets are in sight, five or six miles to port. A string of bunting runs up

the Admiral's signal halyards. It is the order to open fire. A blinding white sheet of flame leaps from the forward turret of the leading ship. A cloud of yellow gas rolls out over the waters and momentarily shrouds the vessel from view, and, as the seconds fly, you hear a dull, ominous roar. A boiling, whirling white column springs up in front of the target, almost to the height of the tops of the towing ship, and falls in graceful cascades, drenching the target raft. With a rush and a roar the shell goes ricochetting, spinning, with tremendous velocity, until it strikes the water for a second time and then skips along the surface for a few hundred yards more before it finally flops under.

Another ranging shot, and then the full force of the ship's broadside is let loose. The vivid flashes come singly, by pairs, by salvos. The water about the target is whipped into boiling geysers by the falling shells. Two projectiles strike, one just over, the other just under—a perfect "straddle." A shell tears through the target-screen, another strikes the raft itself, while a third carries away the top of one of the masts.

Inside the turret the scene contrasts strangely with that outside. The steel-walled chamber is dimly lighted by the rays of the battle-lanterns. Its white interior seems strangely clean and

peaceful. In the extreme rear of the turret is the small booth in which the turret-officer is stationed. Here he is in telephonic communication with the fire-control officer, and at the same time in immediate control of his own men at the guns mounted on either side of the steel bulkhead that separates the two pieces so that an accident in one compartment may not affect the crew at the other gun. Pipes and tubes, electric bells, and signal indicators line the walls. The breech of the great gun takes up most of the available central space. The gun-crew are at their stations about it, every man stripped to the waist. The heat is oppressive. Streams of perspiration show on the men's brows. For the hundredth time, the turret-captain examines every part of the breech mechanism and tests the firing circuits, while the gun-captains give the final instructions to their men. Presently the pointers and trainer bring the gun to bear upon the distant target. The turret revolves beneath their feet. "Coming on the range!" is the word received over the telephone from the fire-control station. "Stand by!" The visual clicks at intervals, and the sight-setters check their corrections. "Load!" From the handling room below the ammunition car comes up with a rush. The 870-pound shell is pointed into the breech and shoved into the gun by an electric rammer that untelescopes wickedly



"Coming on the Range!"

and "seats" the projectile with a mighty thud in the rifling of the barrel. Four powder-bags, weighing over eighty pounds each, follow the shell into the breech with amazing rapidity. The plug swings smartly home, closing the breech, the primer is inserted, and the lock cocked. "Ready!" Up where the pointer stands, abreast of the gun, a tiny red light appears, electric bells ring, then—a dull roar and a sharp jar. The gun recoils back three feet and then returns to "battery," its original position, with astonishing ease. The plugman spins the handle of the breech plug, the 1,700-pound steel plug swings open to the accompaniment of a hissing as a blast of compressed air clears the bore, and then the next charge is loaded.

We hear a great deal about the short life of these big guns, of the few times they can be fired before others have to be installed to replace them. But nowadays much has been done, by improved construction and through a better knowledge of the powder used, to greatly increase the number of rounds that can be fired. As is generally known, the interior of the gun is rifled, that is to say, it has spiral grooves in it throughout its entire length. Copper "driving" bands are fitted to the shells, and the impact of the explosion forces these into the rifling grooves, preventing the escape of the propelling gases and giving

the projectiles the twist that steadies them during their flight. The terrific energy generated by the explosion of the 320-pound smokeless powder-charge in a twelve-inch gun may be gauged by the fact that the projectile leaves the muzzle at the speed of 2,900 feet per second—with an energy that, translated into lifting power, would suffice to hoist one of our present-day Dreadnoughts two and a half feet into the air. Now, such a generation of heat by explosion within a confined space is bound to result in wear, and the "wash" of the rapidly moving white-hot gases tends to smooth out the rifling. Well-fitting bands and "gas-checks" on the shells somewhat minimize this wear, but the accuracy of the gun must suffer in the end, and the only thing to do then, is to reline the bore, the cost of which is only a fraction of that of a new gun.

"A reckless expenditure of the funds of the Navy Department!" Hardly. Some of the Service's Congressional critics may consider target-practice a wanton extravagance, and advance pet theories to support their contention, but target-practice, nevertheless, must be held. It develops the team-work of the ship and the team-work of the fleet as no other exercise can. It often furnishes information of such importance that it has had a very great bearing on subsequent ship designs and has enabled the materiel bureaus

of the Navy Department to improve the designs of our more modern battleships. And target-practice at times teaches the Navy even more. The visit to the fleet of Mr. Harrington Emerson, an expert in efficiency, revealed to that interested critic a state of affairs such as he had not found anywhere else in this country. Instead of antiquated methods and poor results, Mr. Emerson found, to his surprise and delight, the most marvelous efficiency. He saw the American Dreadnought fire a salvo of twelve 12-inch guns in thirty seconds, while steaming at full speed, and hitting a sixty-by-thirty-foot target eight miles away, with six shots out of twelve fired. One hit every five seconds! Mr. Emerson was fascinated. He forgot that he was a central authority on efficiency, and became, for the time, a student. Are not the men and the methods by which such results as these are produced entitled to respect?

Naval gunnery is, indeed, wonderful when you consider the conditions under which it is held. A target-screen, one-tenth the area of the broadside of the hull of a battleship, appears as a fast-moving dot upon the windy sea. The target is rolling and pitching; the ship that is firing at it is rolling and pitching, yet the target is pierced again and again. The more you know about the attendant difficulties the more creditable does the

best of our naval shooting seem. But that best must not narrow our horizon. Other navies are likewise drilling their squadrons, and other fleets are holding long-range target-practice. Our pointers are doing good work on the Southern Drill Ground every spring and fall, but is their best shooting always better than the best records made by the pointers in other navies?[4] That is a question that only the test of battle can answer. In the mean time, every effort must be made to maintain the high standard of efficiency developed by our navy in 1804, in 1812, in 1862, and again in recent years—a standard that brought us victories in the past, and that, if lived up to, cannot fail to bring as decisive successes to our arms afloat in the future.

[4] The battleship *Arkansas* last September established a world's record with one of her twelve-inch turrets. During Elementary Practice the two guns fired six shots in 57 seconds at a moving target, at 2,000 yards, making a perfect score. On the other hand, the British battleship *Centurion*, made a record during the past year with the Percy Scott fire-director system which, if reported correctly, is indeed remarkable. The two 13.5-inch guns in one of her amidship turrets fired eight rounds and scored eight hits in 2 minutes and 35⅘ seconds at long range, using a target only fourteen feet square.

APPENDIX

APPENDIX I

That naval officers, as a class, are ready to undergo any hardship, to incur any risks, and to sacrifice life itself in the performance of duty in time of war, or at the call of humanity in time of peace, requires no extended proof. Out of the thousand instances which crowd upon the recollection, we need only mention Richard Somers, who calmly met his fate in the mysterious and awful explosion of the ketch *Intrepid* off Tripoli; Tunis Craven at Mobile, whose ship became his coffin because, in the nobility of his nature, he could not help stepping aside from the ladder which led to safety and saying, "After you, pilot"; John Talbot, who sailed 1,200 miles in an open boat to summon assistance to the shipwrecked crew of the *Saginaw* only to perish in the surf at Hawaii; George De Long, whose tragic end established a standard of Christian heroism which few may reach and none may surpass.

The bedrock of our navy has been its organization; its soul, honor; its demand, courage; its inspiration, love of country; its crown, glory. But its keynote, its foundation stone, is obedience—and that also has been its ruling impulse

in practically every instance of fortitude and self-denial, with which our naval annals abound—obedience to the letter, and when the letter fails to carry the man deeply enough into the dangers and trials which beset the path to his goal, the letter disappears and the spirit takes its place as the guiding principle.

When Wadleigh, in 1881, was looking for possible survivors of the *Jeannette's* crew, it was this spirit which carried him in a wooden cruiser, the *Alliance,* beyond Spitzbergen—above 80 north latitude—farther north than any vessel of her description had ever been before; and much farther than such a vessel should go, unless justified, as Wadleigh was, by an overwhelming if mute appeal. Says the chronicler of this extraordinary expedition, "if the ship had been nipped, she and her whole complement of one hundred and eighty men would have disappeared from the face of the earth without ever making a sign."

The same fidelity to a lofty ideal of obedience joined to sympathetic humanity actuated Berry, when his own vessel, the *Rodgers,* sent to De Long's relief, was burnt to the water's edge in Behring Sea. Hearing from the Chukches the rumor that strange white men had landed somewhere on the northern coast of Siberia, Berry started out with a scant native escort and

tramped over one thousand miles along that bleak shore, in the winter season, hoping against hope that he might arrive in time to succor.

Nor can the historian recall a finer picture than H. B. M. S. *Calliope,* steaming out of the harbor of Apia, in the teeth of the frightful hurricane of 1889 and, as she passed the *Trenton,* the only vessel beside herself still afloat out of that large assemblage of shipping, receiving the cheers of a crew gallant and generous in the very face of death.

When Greeley's fate was shrouded in mystery and the whole country trembled between hope and fear of tearing aside the dark veil, upon the Navy it called to do the impossible. And by it the impossible was done. Leaving far astern of them old experienced Arctic voyagers, Schley and Emory forced their way in gales of wind, which opposed them with cruel, demoniac fury, through snow and ice to reach Cape Sabine not only greatly in advance of any previous record, but at the very last instant when their coming could avail. Even twenty-four hours later few, if any, of Greeley's party would have been alive to save.

Happily the achievements of the Navy during peace are not always so tragic and gloomy. Oftentimes they are humdrum, unheralded, overlooked, almost unknown. And none the less

valuable are its many services of this kind. In order that the navigator may plough his way along our shores in security, the navy mapped the dangers visible and hidden and sounded out the safe passages from Calais to the Rio Grande, from Tia Juana to Cape Flattery. That a succession of able superintendents of the Coast Survey have directed this work does not detract from the credit due the officers and men of the navy who, until 1898, in season and out of season, sounded and took angles and kept their parties busily employed gathering the facts and figures upon which the cartographers have built their worthy and enduring monument. And the same thing is seen all over the world today. Whenever a ship is not engaged in drilling and firing at a target, her officers and crew rest themselves by making surveys of remote and uncharted waters.

In this country, the appreciation of these labors is confined to the few who interest themselves in such matters, but abroad it takes the shape of generous public recognition. For example, his compatriots only know Sigsbee as the captain of the ill-fated *Maine,* but across the ocean he is a man whom kings delight to honor and to decorate for his notable improvements in deep-sea dredges and sounding apparatus.

These investigations of the ocean's secrets are not always free from inconvenience and misinter-

pretation. When Pillsbury was measuring the width and depth and strength of the Gulf Stream, he anchored the *Blake* one day in some hundreds of fathoms by a grapnel and a light wire rope. A coasting schooner passing that way, her skipper's curiosity was aroused by the sight of a vessel apparently stationary in spite of wind and current, so he tacked under the *Blake's* stern, hailed Pillsbury and asked him what he was doing. "Oh, nothing important," replied the latter. "I'm just anchored." The voice of indignant skepticism came booming back over the sea, "You are a d—d liar!"

The world is indebted to the late Professor Dana for his scientific system of mineralogy which encountered little difficulty in displacing the more empirical forms by which it had been preceded. But Dana's view of things was broadened by his years spent on board a man-of-war in Wilkes's Exploring Expedition, and the navy, or at least the opportunities which the navy afforded, may rightly claim even a slight share in placing the laurel wreath upon that worthy brow.

And the navy, too, furnished a painstaking philosopher who wrote that epoch-making book, the *Physical Geography of the Sea,* which told the sailors of these United States, and of every other civilized power, how to navigate the oceans

broad and the waters that wash their own shores. Is it not pertinent to inquire what it would cost the nautical world to erase the name of Maury from history's page?

And lastly there is that great engineering feat, the construction of the Panama Canal. And in no other connection are facts—bottom facts—so imperatively essential. For it was the navy, by its faithful and laborious study on the spot of the many suggested lines across the great isthmus that collected the information and supplied the necessary data for this colossal undertaking.

Can it be said, in the face of such a record of achievement, that our navy has not earned the gratitude of the American people as a civilizing force during times of peace?

APPENDIX II

The Navy of the United States, Organization and Distribution, February 1, 1914

ATLANTIC OCEAN

Atlantic Fleet

Wyoming (fleet flagship)

First Division: Florida, Arkansas, Delaware, North Dakota, Utah.
Second Division: Louisiana, Michigan, New Hampshire, South Carolina, Vermont.
Third Division: Rhode Island, Georgia, Nebraska, New Jersey, Virginia.
Fourth Division: Connecticut, Kansas, Minnesota, Ohio.

Torpedo Flotilla

Birmingham (flotilla flagship)

Dixie (tender)

First Division: 5 destroyers (in reserve).
Second Division: 6 destroyers (in reserve).
Third Division: 5 destroyers.
Fourth Division: 5 destroyers.
Fifth Division: 5 destroyers.
Sixth Division: 3 destroyers.
Seventh Division: 3 destroyers.

Submarine Flotilla

First Division: Severn (tender), 5 submarines.
Second Division: Tonopah (tender), 5 submarines.
Third Division: Ozark (tender), 3 submarines.

Fleet Auxiliaries

Two supply ships (Celtic and Culgoa).
One ammunition ship (Lebanon).
Four tugs (Patapsco, Patuxent, Ontario, and Sonoma).
One repair ship (Vestal).
One mine depot ship (San Francisco).
One hospital ship (Solace).
One torpedo training ship (Montana).
One yacht (Yankton).

Ships in Reserve

Atlantic Reserve Fleet

Battleships: Idaho, Maine, Missouri, Alabama, Illinois, Kearsarge, Kentucky, Wisconsin, Indiana, Iowa, Massachusetts.
Armored Cruiser: Tennessee (flag).
Scouts: Salem.
Repair Ship: Panther.

Reserve Torpedo Divisions

At Annapolis, Md., 1 destroyer, 4 torpedo boats.
At Charleston, S. C., 5 torpedo boats, 1 submarine.
At Newport, R. I., 1 destroyer, 3 torpedo boats.

PACIFIC OCEAN

Pacific Fleet

Pittsburgh (flag), California, Maryland.

Torpedo Flotilla

Iris (tender), 5 destroyers.

Submarine Flotilla

First Division: Alert (tender), 4 submarines.
Second Division: Cheyenne (tender), 3 submarines.

FLEET AUXILIARY

Glacier (supply ship).

SHIPS IN RESERVE

Pacific Reserve Fleet

Battleship: Oregon.
Armored Cruisers: West Virginia (flag), Colorado, South Dakota.
Cruisers: Albany, Charleston, Chattanooga, Milwaukee, St. Louis.
2 submarines, 1 tug (Fortune).

Reserve Torpedo Division

At Mare Island, Cal., 4 destroyers, 2 torpedo boats.

ASIATIC FLEET

First Division: Saratoga (flagship), Cincinnati, Galveston.
Second Division: Elcano, Helena, Quiros, Samar, Villalobos.
Third Division: Callao, Wilmington, 1 tug.
Fourth Division: Monadnock, Monterey, Pampanga.

TORPEDO FLOTILLA

Pompey (tender), 5 destroyers.

SUBMARINE FLOTILLA

Mohican (tender), 6 submarines.

FLEET AUXILIARIES

One transport (Rainbow).
One tug (Wompatuck).

SPECIAL SERVICE AND UNASSIGNED

Special Service

One monitor, 1 armored cruiser, 1 gunboat, 1 supply ship, 2 tugs, 3 yachts.

General Service

Atlantic Ocean: 2 cruisers, 2 transports, 4 gunboats, 1 tug, 8 fuel ships, 26 tugs.

Pacific Ocean: 3 cruisers, 1 transport, 1 gunboat, 4 fuel ships, 7 tugs.

In Reserve

One armored cruiser, 5 cruisers, 3 gunboats, 2 torpedo boats, 6 fuel ships, 1 torpedo practice ship.

Surveying Duty

Three vessels (Eagle, Hannibal, Paducah).

Aeronautic Station Ship

Mississippi

Repairing

One cruiser, 1 fuel ship.

OUT OF COMMISSION

Four cruisers, 2 monitors, 5 torpedo boats, 10 gunboats, 1 transport, 1 hospital ship, 2 fuel ships, 1 repair ship, 11 converted yachts.

FITTING OUT

Two battleships (New York and Texas), 1 cruiser (Brooklyn), 2 destroyers, 6 submarines.

UNDER CONSTRUCTION

Three battleships, 12 destroyers, 11 submarines, 3 gunboats, 2 fuel ships, 3 tenders to torpedo vessels.

AP

The Organ

Electrical Gunner—Radio Ch. Electrician (1)—Radio Electricians (3)
Ordnance Gunner—Chief Gunner's Mates (2)—Yeoman (1)
Fire Control Officer—Electricians (2)—Gunner's Mates (3)
Torpedo Officer—Chief Gunner's Mate (1)—Gunner's Mates (7)
Ordnance Officer
Division Officers
Turret No. 1
Turret No. 2
Turret No. 3
Turret No. 4
Turret No. 5
Turret No. 6
Each
Chief Turret Captain (1)
Gunner's Mates (2)
Boatswain's Mates (2)
Coxswains (2)
Seamen (21)
Ordinary Seamen (28)
Electricians (1)
Masters-at-Arms (1)
5-inch Battery For'd
Gunner's Mates (2)—Boatswain's Mates (2)
Coxswains (2)—Seamen (10)—Ord. Seamen (20)
5-inch Battery Aft
Gunner's Mates (3)—Boatswain's Mates (2)
Coxswain (1)—Seamen (18)—Ord. Seamen (26)
Masters-at-Arms (1)
Navigator
Chief Quartermasters (2)
Ship's Quartermasters (5)
Signalmen [Sea. and Ord. Sea.] (16)
First Lieutenant
Chief Master-at-Arms (2)—Yeoman (1)
Chief Boatswain—Chief Boatswain's Mates (2)
Coxswains [Str.] (4
Sailmakers (1)
Sea. and Ord. Sea. [Special] (27)
Chief Carpenter—Chief Carpenter's Mates (2)
Carpenter's Mates (6)
Shipwrights (6)
Shipfitters (3)
Blacksmith (1)
Plumbers (2)
Painters (4)
Printer 1)

K III

OF THE SHIP

ficer

Deck

APPENDIX IV

The Weekly Routine on Shipboard

Day	Morning	Forenoon Drills	Afternoon	Evening
Monday		Battery or divisional	Ship's work Boat exercises Seamanship instruction	Night signalling or other exercises
Tuesday	In port 1st and 3d Bags and hammocks	Same as Monday	Same as Monday	Same as Monday
Wednesday	Mattress covers	Fire and collision and divisional	Mending Bag inspection	Night signalling Searchlight exercises
Thursday	Boats and bright wood work	General Quarters	Same as Monday	Same as Monday
Friday	Hose and canvas	Air bedding Overhaul battery. Inspect material	Inspect bedding Same as Monday	Same as Monday
Saturday	General cleaning	Commanding Officer's Inspection	Holiday	
Sunday		Quarters for divisional muster and inspection at 9.30	Holiday	

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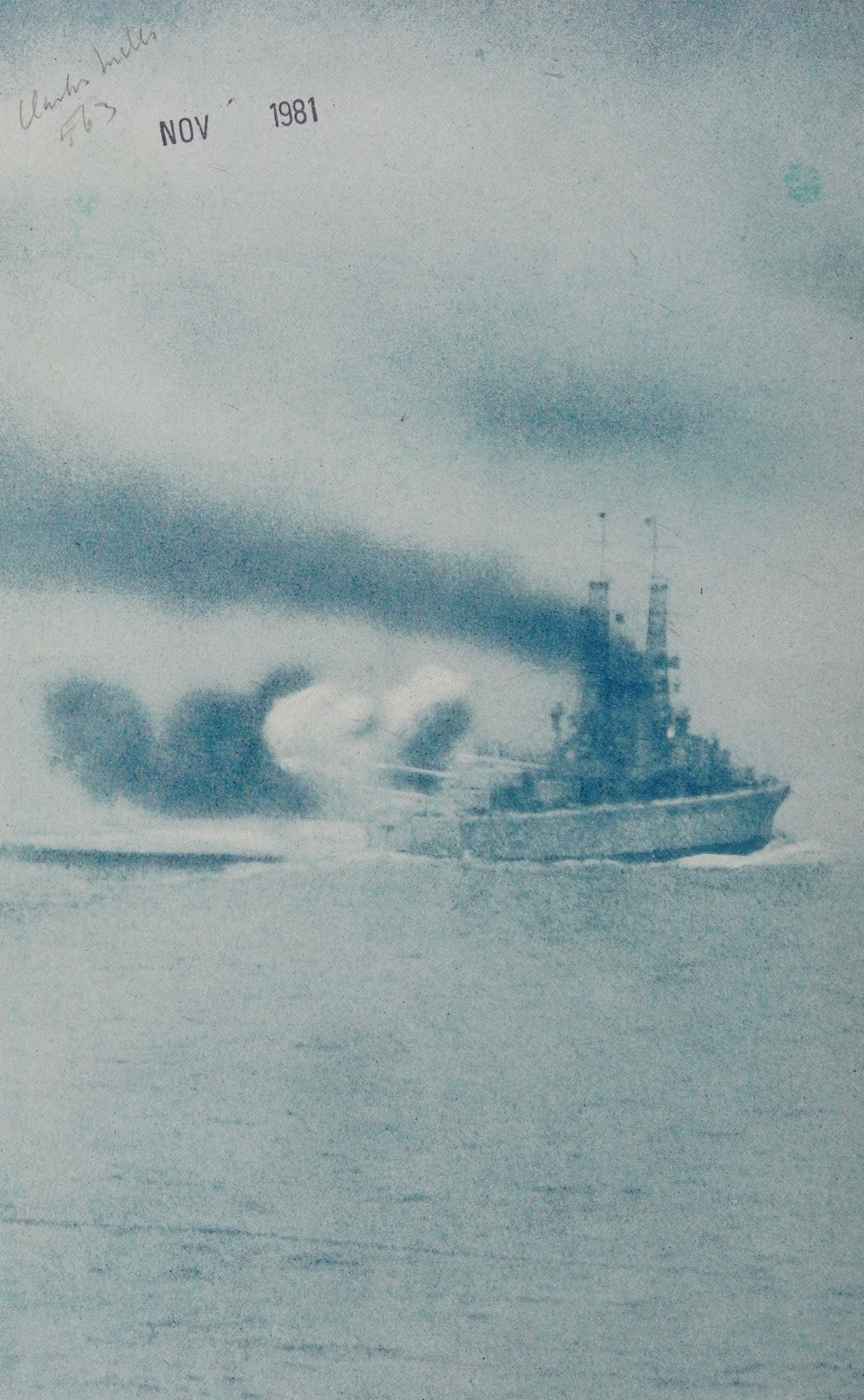

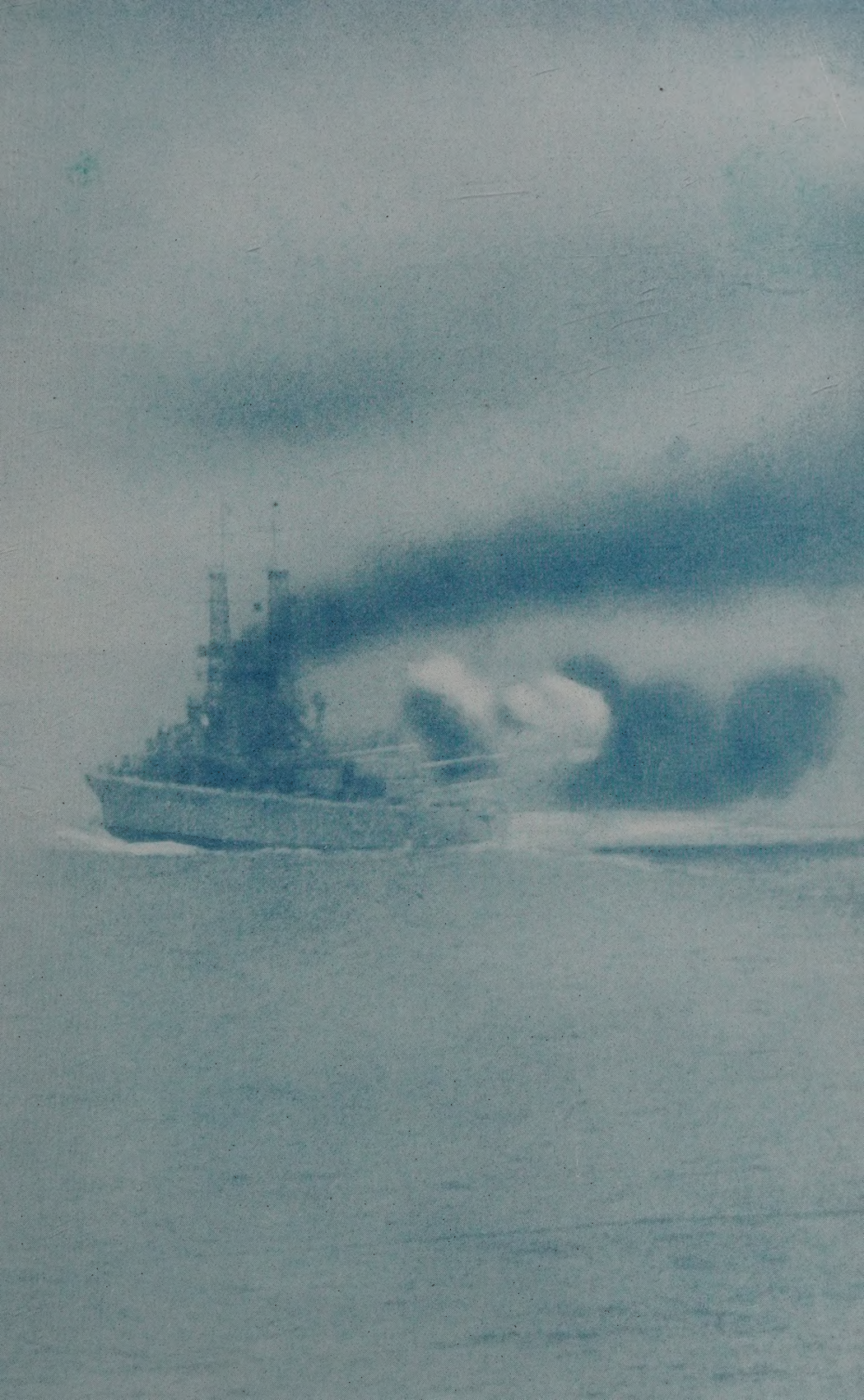

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